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Including the Railroad Gazette and the Railway Age

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CONTENTS

EDITORIAL:

Editorial Notes	823
The Substitution of the Sale of Legislation for Votes for Its Sale for Cash	825
New York's Freight Terminal Problem.....	826
New Books	826

LETTERS TO THE EDITOR:

Good Points in English Passenger Train Service; by C. J. Morrison	827
The Station Agent's University; by Harvey A. Thomas.....	827
*The Design of Concrete or Reinforced Cross-Ties; by Paul M. La Bach	828
Punishment for Intoxication.....	828

MISCELLANEOUS:

*Steel Passenger Car Design.....	829
*Maintenance Cost and Duty Performed by Freight Cars; by J. C. Fritts	833
Automatic Stops and Audible Signals.....	834
National Valuation Convention Urged; by H. Bortin.....	836
Arbitration of the Firemen's Wage Controversy.....	838
*Southern Railway Freight Station and Office Building at Atlanta, Ga.	839
*Articulated Electric Locomotives for the New York Central.....	841
*New York's Freight Terminal Problem.....	843
*Southern Pacific Bridge at Sacramento.....	846
Governor Cruce's Message Vetoing Oklahoma Train Crew Bill.....	849
*The Otis Inclined Freight Elevator.....	849
Foreign Railway Notes	838, 850

GENERAL NEWS SECTION.....

* Illustrated.

A UNIQUE meeting took place in New York under the auspices of the American Society of Mechanical Engineers on Tuesday evening. The subject of Steel Passenger Car Design was treated in its most important phases by thirteen engineers, each of whom may be regarded as an expert on the particular part of the subject which he spoke on. The papers were short and, in almost all cases, to the point. It is unfortunate that more time could not have been given to the open discussion, and yet it is doubtful if so much valuable information could have been brought out at one meeting in any other way. The large meeting room was crowded to the very end of the session, which was adjourned at a late hour. The remarkable and widespread interest which has attended the two railway sessions of this society indicates remarkable possibilities for the discussion of mechanical department problems on broad engi-

neering lines, and may well be studied by the managements of our railway clubs and mechanical department associations, several of which are getting anything but efficient results because of a lack of intelligent and active interest on the part of those in charge.

IN Texas the train crew bill was defeated by the opposition of the farmers. In Oklahoma the governor vetoed it, on the ground that it was wrong in principle and would tend to increase railway expenses and rates. We publish elsewhere Governor Cruce's veto message. The Chicago Association of Commerce, perceiving that the tendency of such legislation is to make rates higher, has adopted a resolution opposing it in Illinois. It is very surprising that the commercial travelers and shippers, who in the past have been so active in promoting legislation concerning passenger and freight rates, have been so slow to manifest opposition to measures which without increasing safety increase operating expenses and which thereby tend to keep rates up or to justify advances in them. Every full crew bill passed is an argument for higher passenger and freight rates. Legislatures and commissions in regulating rates can hardly ignore increases in operating expenses forced on the railways by law; and even if they do ignore them, the courts will not. If the traffic representatives of large industrial concerns and commercial organizations were as much alive to the interests they represent, as they have been at some other times, they would be as actively opposing most of the legislation that is being promoted by the lobbyists of the railway brotherhoods, as they were in opposing the general advances in freight rates over two years ago. They would likewise be active in agitating for legislation to so amend the Erdman Act as to secure reasonable settlements of controversies between the railways and their employees regarding wages and conditions of work, for every settlement of one of these controversies that increases wages tends to make more imperative the need for increases in railway rates.

MASTER car builders and mechanical department officers who have been confronted with the problem of efficient maintenance of freight cars have been at their wits' end to devise some unit of comparison which would closely gage the expenditures for maintenance with the duty performed by the cars. The number of these cars is so large that it is impossible to keep a close check on the cost of maintaining individual ones, particularly since a large proportion of them are interchanged generally and may be off the home lines for a considerable part of the time. The cost per car per year is the unit ordinarily used, but, as indicated in the article by Mr. Fritts on another page, it is of little value as a basis for comparison, and the same may be said of the cost per car per mile. Mr. Fritts has given this problem a great deal of attention during the past few years and proposes a unit which takes into consideration the average mileage per car, the average capacity per car, and the average tons per train; a diagram is presented showing the trend of this duty line as compared with that for the cost of repairs per mile run during the last few years on the Lackawanna. The unit proposed seems to be a most reasonable one, and is undoubtedly superior to the basis of comparison which is ordinarily used, particularly if the methods by which these figures are derived in the auditor's office do not vary from time to time.

A TRAIN crew bill is pending in the legislature of Colorado. The general managers of the Colorado lines have announced that if it becomes a law, on the day it goes into effect the issuance of free transportation to the families of railway employees and to railway employees themselves, except when traveling on the business of the companies, will be stopped. Railway managers elsewhere are considering the desirability of following the example of the general managers of the Colorado lines. Such action will be met with the charge that it is "retaliatory." Train crew legislation is being promoted by the brotherhoods of railway employees. While ostensibly in the in-

terest of public safety, it is really intended to increase the number of men that railways must employ. The free transportation issued to employees and their families is sometimes mentioned in the schedules fixing wages and conditions of work. Usually, however, it is not provided for in contracts, and is simply a favor extended by the company to the employee. The activity of certain classes of employees in promoting full crew legislation is a selfish effort to further their own supposed interests at the cost of the companies and the public. Why should the roads and the public be the only ones adversely affected by it? Why should the roads continue to be generous to those who directly or indirectly are responsible for legislation intended and adopted to injure them? If they can save by reducing the free transportation of employees part of the expense caused by train crew and other legislation promoted by employees, why shouldn't they do so? Not all classes of employees are concerned in securing such legislation, however. Clerks, station agents, section foremen, etc., have had little, if anything, to do with it. Furthermore, they are not as well paid in proportion as the members of the various brotherhoods. If action is to be taken reducing free transportation it would seem to be only just that it should be discriminating, and should not affect those who are in no way chargeable with the legislation in question.

WE publish elsewhere an article by H. Bortin, an experienced valuation engineer, advocating early concerted action by the Interstate Commerce Commission, the railways and others interested, for the purpose of laying a broad and deep foundation for the valuation of railways which Congress has required the commission to make. As Mr. Bortin points out, there is no general agreement among even those who have devoted the most study to valuation and had the most experience in making valuations, regarding the exact meaning of some of the most familiar terms used in discussions of the general subject. There is equal lack of harmony of views regarding the methods that should be employed. The usual practice in making valuations has been for the public utility corporations to work up a vast amount of data and furnish it to the commission or other body having the work in charge, and for this body to then check over and revise the data and make such additional investigation as it considered necessary. Doubtless the same course will be followed in making the general valuation of the railways. Certainly, however, the Interstate Commerce Commission should not issue any instructions to the railways regarding their part of the work until an understanding has been reached regarding the interpretation of the various terms that the commission must use in issuing its instructions and the methods to be followed in carrying them out. Preliminary to a conference, or conferences, between the representatives of the railways and the members or representatives of the commission it would seem that the railways themselves should get together through appropriate officers and harmonize their own views and attitude. They have lost much in the past and caused themselves and the commission a great deal of unnecessary trouble by failure to act harmoniously and present a united front. The valuation of railways will be one of the most important pieces of work, if not the most important, ever done in connection with the regulation of railways in this country, and the plans for making it cannot be worked out too carefully and thoroughly. The scheme outlined by Mr. Bortin may not be the best that could be suggested, but it has the undoubted merit of being, as far as it goes, the best that has been suggested.

THE tempest in New England has died down, and the railway atmosphere there may almost be said to be normal. The temperature cannot yet be called normal, for the New Haven road, with its enormous outside burden of the Boston & Maine and other non-paying or poor-paying properties, still has a hard and complicated problem, straining all its resources. If every city were friendly, Mr. Mellen would still face a thousand perplexities. But the agitators appear to be exhausted, at least tem-

porarily. The directors of the Boston Chamber of Commerce have made a report in which they say that the state of Massachusetts ought not to buy the Boston & Maine, nor require the New Haven to give up its control of it. They see that the weaknesses of the Boston & Maine were not caused by the New Haven management, and in their declaration to that effect, they silence one of the agitators' tom-toms. They call for a "strong" state railroad commission, and would like to have more Massachusetts men on the New Haven's board of directors; and in general present a sane, business-like report. How so conservative a body as the Boston Chamber of Commerce could ever have allowed itself to be used as the tool of irresponsible agitators is something of a mystery. Now, even Mr. Brandeis is quiet. Possibly the reduction in the market price of the railways' stocks, which has now been accomplished, is all that he wants. The New England newspapers also are sane. Those with yellow tendencies have little to say, and the substantial journals, all the time knowing that the proper way to deal with Mr. Mellen, whatever his faults, was through rational discussion, have now found the courage to say so. The city of Boston wants numerous railway improvements and the Chamber of Commerce asks for them, but these are not specified definitely, and the project for aiding new steamship lines, so as to increase the export and import trade of the port, is the principal thing mentioned. The problem of providing railway improvements in a big city, and doing it on a safe basis, financially, is always a difficult one, and the vagueness of the Boston report gives evidence of this fact. The men who framed it realize the magnitude of the task. The city and the railroad are now ready to begin their negotiations where they ought to have begun a year ago.

PROVIDENCE, the other storm center, has had its problem reduced, as compared with Boston's, to the acme of simplicity. The Grand Trunk, after spending two and a half millions on its Providence branch, offers to give away the property outright. If the state of Rhode Island or the city of Providence will take the unfinished railroad and complete the job the Grand Trunk will not only make this big contribution, but will pay 5 per cent. on whatever money the Rhode Islanders may put into the enterprise. In the language of the street, "money talks"; and in this case it talks in very simple terms. Moreover, the answer which it calls for can be (and ought to be) expressed with equal force and simplicity. As an opportunity to translate the talk of stump speeches and irresponsible legislative and newspaper discussions into actual business enterprise, this offer of the Grand Trunk is a notable event. It is claimed that the road is backing out of an agreement dishonorably; that the officers of the company promised to build a railroad to Providence. As to whether this agreement was in writing or what were its precise terms nothing is published. No evidence is produced to show that there was even a moral agreement, nor do we know with whom the agreement was made. That the officers of the Grand Trunk honestly intended to build the road is clear enough from work that has already been done. They would not have spent two and a half millions just to scare the New Haven. Whatever may be the fact as to honor or dishonor, it is difficult to see any better way out than that which is offered. It appears that the Grand Trunk has been forbidden by the Dominion government to involve itself in big investments outside of Canada; and that no money can be raised for the Providence extension without the Grand Trunk's endorsement, because of doubts as to the profitability of the proposed line. If it be said that the Grand Trunk directors ought to go into their own pockets for the six millions to complete the road, they will reply that Mr. Hays, now dead, went into this enterprise without their authority. We hold no brief for these directors, and know nothing of their thoughts or intentions beyond what is published; but in the present aspect of the case Mr. Chamberlin's offer to operate the road, and pay 5 per cent. on its cost, would seem to be a proposition which the people of Providence ought to regard as

thoroughly business-like. At any rate, as we have said, there will now be a fair opportunity for all citizens to get a very lucid lesson on the general question of the relations of the state to the railroads.

THE SUBSTITUTION OF THE SALE OF LEGISLATION FOR VOTES FOR ITS SALE FOR CASH.

THE enactment of laws in various states, especially to further the supposed interests of railway employees and with the effect of increasing railway operating expenses suggests some not very pleasant reflections on certain contemporary tendencies in politics and government in the United States.

The present is being exalted by many writers and speakers as a period of reform in public affairs. One of the reasons assigned is that the corrupting influence of capital over politics and legislation is being reduced or abolished. There are indications that in the minds of many reform consists in substituting the corrupt and corrupting influence of their own class over government for the corrupt and corrupting influence of other classes. It is true as to railway corporations specifically that in many states and in the nation they formerly used free transportation, and in some cases even cash, to control the action of political conventions, law-makers and even governors. On occasions this was done to secure legislation unduly advantageous to the railways; at other times to prevent legislation unjustly prejudicial to them. The immorality and criminality of these practices have been universally recognized and denounced. In consequence of the aversion to them of honest corporation officials, of the public sentiment that has been manifested, and of legislation which has been passed they have been almost abolished. It is now even against the law for a corporation to contribute to a national campaign fund. Today almost the only means used by railways to influence public regulation of their affairs is the most open presentation of facts and arguments to the public, to regulating commissions, to law-making bodies and to public executive officials.

Capital has much money, but relatively few votes. Labor organizations have relatively little money, but many votes. While the illegitimate use of money to influence legislation has greatly decreased, the illegitimate use of votes to get it is rapidly increasing. Citizens are given the suffrage in order that they may protect and further their legitimate interests; and the *legitimate* interests of every citizen coincide with those of the public. Therefore, no man or class of men has any moral right to use his vote or its votes to promote ends that are contrary to public ends. Men are elected to legislatures and to other public offices solely to serve public purposes. They have a right to solicit and secure votes by promising to carry out, and by carrying out, policies intended and adapted to promote the interests of the public. They have no right to solicit and secure votes by any other means or for any other purpose whatsoever.

Now, the members of the railway labor brotherhoods through their legislative representatives are seeking legislation such as that to increase the size of train crews in the pretended interest of safety, but for the real purpose of increasing the number of men that railways must employ. There is not a single well-authenticated case on record of a fatal accident caused by the want of enough men in a train crew. Governor Sulzer of New York, in a statement defending his action in signing the full crew bill in that state, said "the truth is that nearly all the accidents of recent years might be prevented by the employment of more men." If Governor Sulzer, in making that statement, did not say what he knew to be false, he is the most ignorant man regarding the facts about American railway accidents who ever undertook to discuss them. No assertion on the subject more utterly incorrect and misleading ever emanated from any source; and it is incomprehensible how the governor of a great state, having any sense of his public duty or responsibility, could have given it currency, supported by the weight of his name and official title. The only accident specifically referred to by him—that in which, as he says, 41 persons were killed—was due to neglect of an engineman who had on the engine with him a

monitor, presumably competent, in the person of his fireman. How would the third brakeman called for by the new law have tended to prevent the engineman's error? The fact is that the full crew legislation not only does not increase the safety of transportation, but interferes with making it more safe. It has been estimated by the special Committee on the Relations of Railway Operation to Legislation that a federal full crew law would increase railway operating expenses \$12,000,000 a year. That amount is 5 per cent. on an investment of \$240,000,000. It has been estimated by the same authority that for \$260,000,000 all the railways could be equipped with the block system. Now, the universal installation of block systems would materially increase safety, while full crew legislation does not increase it in the slightest degree. In other words, the full crew legislation, by requiring an addition to operating expenses which does not increase safety does tend strongly to interfere with the installation of the block system which would increase safety. The only effect of full crew legislation is needlessly to increase the operating expenses of the railways. This causes economic waste, the ultimate effect of which is to injure the public, because all of the operating expenses of the railways must be paid from revenues derived from freight and passenger rates. Mr. Sulzer's utterance accentuates the change that has taken place in the executive mansion of New York state since Charles E. Hughes was governor; and the fact that the governor of Oklahoma vetoed the full crew bill in that state illustrates one improvement that has taken place in affairs in Oklahoma since Charles N. Haskell was governor.

The means by which the railway employees are securing such legislation is by indicating that the law-makers who vote for their bills and the governors who sign them will benefit by being given their votes, while those who refuse to do so will suffer correspondingly. In other words, they are bribing the law-makers and the governors with votes in the same way, for the same purpose and with the same effect, as corporations have in other years bribed law-makers and governors with cash. The law-makers who are voting for these bills and the governors who are signing them, if they are acting with a scintilla of intelligence, know that they are contrary to the public interest. To all appearances they are being passed and signed because those who pass and sign them believe that while they are designed and adapted to confer special privileges on a class at the expense of the public, they will secure votes for those who pass and sign them. In other words, railway employees are consciously bribing public officials with their votes, and public officials are consciously letting themselves be bribed by them into passing and signing legislation which sacrifices the interests of the many for the supposed benefit of the few.

Neither morally nor in the results to the public does the huckstering of legislation in exchange for votes differ essentially from its purchase and sale for cash. Capital in the one case and labor in the other uses the currency of which it commands the largest supply. That is the only difference. Public men in each case sell the same commodity, namely, the public welfare. The two kinds of transactions equally involve moral turpitude, are equally shameful, equally contrary to the duties of citizens of a democratic state, equally disregard every dictate of honor and duty by which public officials should be governed. That this is not generally recognized simply shows that there is need for a much greater public awakening on moral and political questions than has yet occurred. That the men who in public life are loudest in denouncing improper activities on the part of corporations are also those who are the most forward to rush into the market and to sell the interests of the public for votes for themselves simply shows that the political hypocrite, demagogue and dispenser of buncombe are still with us.

The immorality and wrong to the public of the sale of special privileges to capital for cash has become clearly and generally recognized. When will the immorality and wrong to the public of the sale of special privileges to certain classes for votes become as clearly and generally recognized?

NEW YORK'S FREIGHT TERMINAL PROBLEM.

THERE has never been a far-sighted co-operative plan for handling New York's local freight traffic on Manhattan and for properly developing its harbor. The old hand-to-mouth policy of handling local traffic on the west side waterfront of Manhattan has been pursued until it has reached its limit of development, but the volume of traffic is ever increasing. The serious congestion, delays and excessive terminal expenses entailed by this system make expansion imperative. To continue to develop along the old lines the railroads would require more space on the west side waterfront. This is not available and cannot be created. Moreover, the greater part of the space now occupied by the railroads on the waterfront is urgently needed for the expansion of shipping facilities. This waterfront space is the just inheritance of the steamship companies and the welfare of the city demands that they be permitted to make full use of it. As the railroads can never hope to handle the future growth of traffic with their present facilities, and as expansion on the waterfront is out of the question, only one course is left—to go elsewhere.

Confronted with this situation the roads terminating on the New Jersey shore of the North river have continued to hold back, vainly contending that the steamship companies should be forced away from the waterfront for their benefit. They have made no attempt to solve the problem along new lines and have individually considered and condemned each plan that has been devised for them. Some of the proposed solutions are outlined on another page. Perhaps a successful solution of the problem has not yet been presented, but the thing most to be deplored is that the criticism of the Jersey roads has been solely destructive. The limited amount of desirable space and the enormous expenditures involved make co-operation necessary to secure maximum efficiency and minimum expenses. Obviously a satisfactory solution of this problem can never be reached without the assistance of the railroads, but thus far the Jersey railroads have flatly refused to co-operate because of the rivalry and jealousy which exist between them.

The city stands ready to lend its valuable assistance to the successful completion of any project which shall meet with general approval. Funds for the initial costs of the improvements can be raised at a lower rate of interest by the city than by the railroads, and if these improvements were built and owned by the city the rental charges would only have to meet the interest charges, maintenance and amortization. No profit would be necessary. The city would be willing to do this because the bonds would be self-supporting and therefore excluded from the debt limit, there would be no public burden and the city would reap enormous benefits indirectly.

Apparently the New Jersey roads lose sight of the fact that the New York Central is their common rival, that its position today is decidedly more advantageous than theirs, and that it has plans under way to still further increase this advantage. If the plan, which has been drawn up by the Board of Estimate's committee on terminal improvements, is approved, the New York Central will cover its tracks on the west side of Manhattan above Seventy-second street, will build a subway south from Sixtieth street connecting with all its terminals, and will remove its present surface tracks south of Sixtieth street. The chief advantages of this plan to the city are negative. The city will have a little more park space along the upper west side, a little less smoke and the dangers of the surface tracks will be eliminated. The New York Central will have a much better connection with its terminals, but the great problem of a co-operative terminal policy, the only thing which will materially benefit New York both commercially and industrially, is left entirely to the future. The New York Central is strengthening its position. What are the Jersey roads going to do? Their common rivalry should be a bond between them, for if a co-operative policy were adopted and carried out the New Jersey roads, by reducing their terminal expenses, would be enabled to compete more successfully with the Central, they would secure a larger proportion

of New York's traffic and would benefit both individually and collectively.

The undertaking would be momentous and the roads feel that they will not venture on any plan until it can be definitely proved to them that it will reduce costs, facilitate transportation and preserve approximately the same balance of power between them. Until now no committee, properly equipped to draw up a plan to meet all these requirements, has studied the question. A successful plan would involve engineering, operation and the interests of both New Jersey and New York City. Therefore, if a committee were formed, composed of one engineering and one operating officer of each of the roads interested, together with representatives of both New York City and the state of New Jersey, it should not be long before a plan was devised which would be satisfactory to all. Until some such committee is formed there is but little chance of any general policy being agreed upon. In the meantime the situation will become even more aggravated than at present. The present terminal expenses are needlessly high, and therefore involve waste. This waste should be eliminated.

The needed improvements include the evacuation of the west side waterfront by the railroads to permit the expansion of shipping facilities; the establishment of joint terminals and warehouses connected with all railroads and all docks; the diffusion of these terminals to prevent the congestion of drayage; the installation of mechanical devices for handling package freight quickly and cheaply; the partial elimination of railroad traffic from the surface of the harbor to permit more freedom for marine traffic; and above all a reduction in terminal expenses. If it is impossible to devise a plan which will meet all these requirements then the plan which would meet most should be adopted; but until the problem has been properly grappled with there is no means of knowing what can and what cannot be done.

NEW BOOKS.

Locomotive Dictionary. 1912 (Third) Edition. Compiled and edited for the American Railway Master Mechanics' Association by Roy V. Wright, managing editor of the *Railway Age Gazette* and editor of the *American Engineer*, assisted by Porter L. Swift. Illustrated. 901 pages. 9 in. x 12 in. Published by the Simmons-Boardman Publishing Company, New York, and distributed by the McGraw-Hill Book Company, 239 West 39th street, New York. Price, leather bound, \$6; cloth bound, \$4.

The progress made in the design of locomotives, both steam and electric, during the past three years is well illustrated by the contents of this edition of the *Locomotive Dictionary* when compared with the 1909 edition. It has been necessary to go beyond a mere revision of the previous edition, and so far as the illustrated section is concerned, it is practically a new book. The definition section also has been thoroughly revised and considerably expanded. While the Mallet, Mikado and Pacific type locomotives have been given special attention, the lighter types are by no means overlooked. This is especially true in connection with the switching and Atlantic type locomotives. In connection with each locomotive elevation a complete list of dimensions, weights and ratios is given, an improvement which, no doubt, will be much appreciated. It is evident that considerable study has been given to the selection of the typical parts and details that are presented and only approved designs that have been successful in service are illustrated. Cross references between the general and detail drawings are included wherever possible. Among the new sections that have been added are one on mechanical stokers and one on locomotive tool equipment; the sections on oil burning locomotives, electric locomotives, air brakes, and frames and frame bracing have been materially enlarged. The illustrations showing the Master Mechanics' Association standards have been entirely redrawn, making them more legible and greatly improving their appearance. The section on machine tools occupies 60 pages and gives photographic reproductions of practically all kinds of metal working machinery used in the repair of locomotives.

Letters to the Editor.

GOOD POINTS IN ENGLISH PASSENGER TRAIN SERVICE.

NEW YORK, March 15, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

During my recent visit to England several practices of the railroads struck me as of possible interest to your readers. The English method of handling commutation is particularly noticeable. They sell what are known as contracts, good for any period desired from one month to a year and for any number of rides. A person simply purchases a contract covering any two stations and rides as often as he pleases. There is no delay to have a piece cut off of the ticket or the necessity of hiring extra men to punch useless holes in tickets, as is done in this country. The contracts are pieces of light cardboard about 3 in. x 4 in., and show the names of the two stations and the date of expiration in large type, so that they may be read at a glance.

The habit of punching holes in tickets in this country is not only to a large extent useless, but is often annoying. The writer vividly recalls missing a train to Philadelphia in order to get a useless hole punched in a ticket. I entered the ferry office in the last few seconds before the boat left, purchased a ticket without delay, waved it at the man with the punch and rushed for the boat, only to be stopped by the man at the gate in response to a yell from the ticket puncher. The man with the punch had seen me purchase my ticket and saw it in my hand as I passed through the chute, but would not permit me to catch my train because he had not succeeded in punching a useless hole. Another incident, amusing instead of annoying, occurred on the New Haven, where a conductor wanted to argue as to my destination because he had punched the ticket so full of holes that the station had disappeared.

So much for the holes. Probably a more important subject is that of train schedules. English trains are on time. As an English railroad is liable for damages in cases of delay, it becomes necessary to have trains on time, and they are. Everyone seems filled with the idea of time and the necessity for keeping trains on time, not only while running but in the departure from stations. It is of this latter feature that particular notice should be taken, as we are entirely too much given to carelessness in this respect, trusting to our giant locomotives to make up the lost time. Our locomotives do make up this loss over and over again, but at a tremendous expense for fuel and repairs.

Only a few days ago I saw one of our fastest trains lose three minutes at a station simply because the passengers were all in a bunch at the far end of the platform from where the train stopped. At another station the ushers had lined the passengers up at the proper places ready to board the train, with the result that not only was no time lost, but one minute of the loss at the other station was made up. Why not extend this idea?

Of course, one could not help noticing the English platforms on a level with the floors of the cars and hoping that the platforms, in at least the more thickly populated sections of this country, would soon be raised.

We are reported to kill on the average fourteen trespassers on the railroads every day throughout the year, and a great hue and cry has recently been made about the matter. Of course, our laws covering trespassing on the railroads are very lax, but the railroads could help by making trespassing difficult. One can hardly manage to walk on an English railroad track without putting himself to great inconvenience.

Those of us who have stood in the vestibule of a dining car waiting what seemed an endless time for a chance to eat, have fervently prayed for a change. The English method is to "book" a passenger for the first or second service, then call him when the meal is ready. This scheme is made easy for the reason that the meals are served in courses to all at the

same time just as though it was a large family party. A further advantage is the very considerable reduction in the number of waiters required. Americans would probably not stand for such a procedure at home, but a great improvement over existing conditions could undoubtedly be made. Only last week I found a Michigan Central dining car conductor who made out a regular schedule and notified passengers when they could eat. When I found the diner full and the conductor advised me that he would call me in thirty-five minutes, if I would let him know where I was sitting, I demurred on the ground that someone who stood in the vestibule would get my place. However, he informed me that he ran his car according to schedule and allowed no standing in line. It was certainly far pleasanter to sit down comfortably and read until called, and in my opinion this conductor's method might well be extended.

There are of course many points in which we excel, but my idea in writing this letter is to simply call attention to a few items which may be of interest rather than to make a general comparison.

C. J. MORRISON,

Chief Engineer, Froggatt, Morrison & Co.

THE STATION AGENT'S UNIVERSITY.

TEXAS CITY, Tex., April 3, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In your issue of March 28, page 743, there appears an article on "Suitable Studies for Station Agents."

While I have never served a railroad company in this capacity, my railroad experience and an intimate knowledge of the efforts and sacrifices which a small measure of success has cost many of my acquaintances in this line of employment, prompts me to take issue with the writer on some of his views expressed.

While there is but one "royal road to success," there are diversified methods of traveling over that road—depending upon the circumstances of the individual whose ambition spurs him on to something better. Some men who have attained success are really and sincerely of the opinion that experience was their only teacher, yet, if they themselves realized the facts they would be compelled to admit that as a result of one's interest in a particular line one will be impelled to a painstaking study of every article which deals with the subject in which he is interested.

There is no question but that a publication such as the *Railway Age Gazette* is indispensable to a broad view of the various phases of railroading of the present day. The writer is a subscriber for and an ardent advocate of this publication, and acknowledges himself indebted to the publisher and authors of the many valuable articles, which have recently been published, for information which could probably not have been obtained elsewhere. Yet, to the young man who has carefully planned his future course, but who has not been afforded the opportunity of the technical or professional training which he craves through the medium of experience or of a college course, many of the correspondent schools of today afford advantages for advanced study valuable to employee and employer as well.

When one learns to "live on twenty-four hours a day," the time spent in study and mental discipline is an advantage rather than a handicap to his working hours. From practical experience (and for the benefit of others, who, like myself, must acquire their training in the "university of hard knocks") I can state that the subject of law, the various literary branches of a university course, traffic matters, both rail and water borne, and many other important branches, can be successfully taught by correspondence, and that through a study of these courses one can successfully increase his own earning capacity and qualify himself for better service to his employer.

I am submitting this communication solely with the view to offering the encouragement—which I, myself, would have often welcomed—to those who are grasping the only means at hand for attaining to a greater measure of success.

HARVEY A. THOMAS,

Secretary and Local Attorney, Texas City Terminal Company.

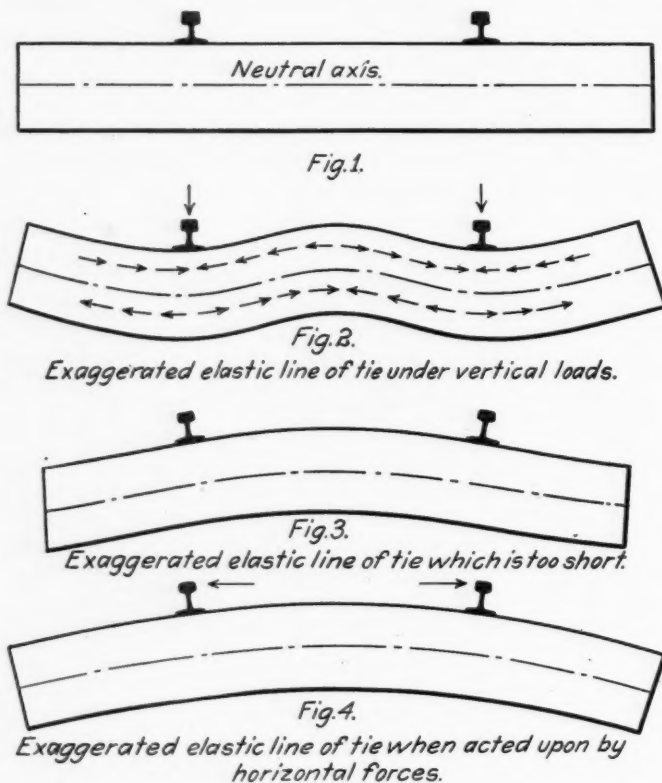
THE DESIGN OF CONCRETE OR REINFORCED CROSS-TIES.

CHICAGO, March 10, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I notice in the papers that a representative in Congress introduced a joint resolution on February 4 directing the Interstate Commerce Commission to investigate and report upon the use and necessity of a certain specified combination railroad tie. An appropriation of \$25,000 goes with this resolution, to provide for the expense of an investigation of this particular tie and other kinds now in track. The investigators are also to consider the question of accidents due to defective track and roadbed and are to have six months to prepare their report.

The first thing that strikes one on reading this item of news is that the Interstate Commerce Commission is being invited to investigate itself. The commission has recently made a report,



after some five years' consideration of these matters, which deals with the subjects mentioned above. (See report of the Block Signal and Train Control Board, *Railway Age Gazette* of February 14, 1913, page 293.) This report covers most of the objections to concrete ties. One point is omitted, however, viz., that the fastenings must provide for different widths of rail bases to allow for relaying.

The joint resolution seems to imply dissatisfaction with this report. Is it because the investigating committee failed to perceive the many exceedingly fine (perhaps invisible) points of some particular make? The *Congressional Record* might consider the propriety of fixing space rates for advertising, and perhaps our bulkiest publication of innocuous fiction might be made to pay. We could then have the pleasure of seeing alongside of speeches that were never delivered, appliances that were never used. Why does our so-called representative feel so much interest in a matter of this sort? Could it possibly be because it is "agin" the railroads?

The impression seems to have gone forth that the railroads are not giving any attention to these matters and know nothing about them. On the contrary, every chief engineer's office in the country is flooded with sundry schemes by which some individual hopes to repeal the laws of mechanics. A little elementary knowledge of mechanics would help most of these inventors. In time,

undoubtedly a good compound tie may be invented by some one and its qualifications must be in the line set forth by the board cited above.

I would suggest to those going into the question that they demonstrate what happens when the compound tie is loaded. These demonstrations can be made mathematically. As a starter, the following will indicate the method. Figure 1 shows a homogeneous tie without a load. Figure 2 shows the exaggerated form of the elastic curve assumed by the tie when placed on a uniformly elastic bearing or ballast. This supposes that the tie is of sufficient length. Figure 3 shows the form assumed when the tie is too short. As will be noticed, the tie is subjected to shearing stresses under the base of the rail. In addition to this, the outer fiber of the top of the tie is in tension (Fig. 2) at the middle and in compression under the base of the rail. The bottom of the tie is in tension under the rail and in compression in the middle. This explains why so many ties are faulty; the materials of which they are composed are not calculated to resist certain kinds of stresses. The wooden cross-tie with considerably less powers of resistance still answers the purpose on account of its approximately uniform elasticity. If these manufacturers and inventors of cross-ties will come forward with a rational explanation and demonstration showing why certain materials have been placed at certain points and other kinds at others, they will always receive attention. It may surprise them, no doubt, to find that statute law, even when its constitutionality has been passed upon by the Supreme Court, will not repeal or abrogate the smallest law of mechanics.

PAUL M. LA BACH,

Assistant Engineer, Chicago, Rock Island & Pacific.

PUNISHMENT FOR INTOXICATION.

WASHINGTON, D. C., March 7, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"SULZER SIGNS HIS FIRST LAW."—These were the headlines that attracted my attention in a recent New York paper, and I was further interested in finding that the law which gave the governor so much satisfaction in signing was one for the punishment of drunken chauffeurs. The governor remarked, "I don't think we ought to countenance drunken chauffeurs." He is right; but what about train employees?

Some years ago I suggested to the railroad commissioners in a southern state that they advocate the enactment of a law making intoxication on the part of train employees, or any employee engaged in the operation of trains, a felony; make drinking on duty a crime.

The states and the federal government are forever passing laws and penalizing corporations for violations of law, but such laws seldom provide a penalty or punishment for the real violator. We are trying to safeguard the public by the introduction of mechanical devices; why not also safeguard the people with a few laws applying to the human agency?

EX-RAILROADER.

[A man in charge of an engine or a train should not be intoxicated or drink on duty; that is generally agreed on; but many railroad officers are now disposed to go further than that; to require total abstinence at all times. It is very difficult, however, to enforce so rigid a rule. Our correspondent is in a sense less radical than railroad managers. He would find it very difficult to enforce his rule; less rigid as a rule, but ostensibly more severe in the proposed punishment. Courts and juries cannot be induced to impose severe punishments except where there is a well defined and serious offense; and cases of drunkenness often are not susceptible of clear definition or satisfactory proof—while yet they are serious enough to afford all necessary moral justification for dismissing and perhaps for punishing the culprit. The brotherhoods, which boast of their influence over legislation, are not very likely to promote a law of the kind proposed; and bills affecting "labor" which are not promoted by the labor unions rarely, if ever, become laws.—EDITOR.]

STEEL PASSENGER CAR DESIGN.

A Symposium of Papers Prepared by Experts for Presentation
Before the New York Meeting of the Am. Soc. Mech. Engrs.

So successful was the railway session of the December meeting of the American Society of Mechanical Engineers that the committee in charge, of which E. B. Katte, of the New York Central, is chairman, immediately took steps, in co-operation with the New York meeting's committee of the society, to plan for another railway meeting to be held in New York. This session, held Tuesday night of this week, was more than ordinarily successful, in spite of the fact that the program was of great length. It consisted of thirteen short papers, each prepared by an expert on the particular phase of the subject assigned to him. Abstracts of these papers follow:

INTRODUCTION TO GENERAL DISCUSSION.

BY H. H. VAUGHAN,

Assistant to the Vice-President, Canadian Pacific.

The advent of the steel passenger car has brought with it many new problems and an opportunity for more diverse opinions than any other change that has taken place in car equipment. The construction of the wooden passenger car developed along fairly uniform lines. The varieties of framing were few and the differences unimportant, while the introduction of steel platforms, wide and narrow vestibules, reinforced end and sill construction and similar improvements occurred gradually, and with practically similar designs on all roads. The change from wood to steel in freight car construction resulted in the abandonment of designs that had almost become standardized and the introduction of many new types, but in this case the principal problem, other than that of obtaining satisfactory designs, has been the extent to which it was advisable to use composite or all-steel construction.

In the case of the passenger car, the types to be employed will probably not be changed by the substitution of steel for wood. The increase in capacity that has taken place in freight equipment cannot be duplicated in passenger cars, and there appears to be no tendency at present toward any increase in length or carrying capacity. The questions that now confront us relate rather to the design and construction of cars of the present type and of the materials that may be advantageously employed in place of the wood which has been used for so long. They are complicated by the necessity of providing for greater safety for the passengers than was secured in the wooden car, with an equal degree of comfort, and the difficulty of anticipating the behavior of this new equipment in the case of accident. Certain difficulties, such as the best systems for heating, lighting and ventilation, are common to both steel and wood construction, and improvements in these matters pertain to general progress rather than the use of steel construction.

The following list, while probably incomplete, outlines in a brief way the important variations that must be considered in deciding on the preferable construction of steel passenger equipment:

Framing	{ Steel underframe All-steel frame.....	{ Center girder Side girder
Outside finish	{ Plated Sheathed	
Roof construction	{ Clear-story Circular	
Inside finish	{ Steel Wood	
End construction	Design and strength	
Floor	Design and material	
Insulation	Material	

No doubt questions of equal importance have been omitted, and in many cases those mentioned require careful consideration with regard to degree, as for instance, the strength of the framing or the thickness of the insulation. The list illustrates, how-

ever, the diversity of possible solutions of the preferable steel passenger car.

The steel underframe does not appear to be a satisfactory or permanent development. There is but little saving either in weight or cost over the all-steel construction, and it is difficult to see how the same strength in case of accident can be obtained. Experience will show whether the wood superstructure can be secured in such a way as to prevent working as the car gets old, but as it cannot be arranged to carry any weight this appears questionable. It can hardly be regarded except as an intermediate step between all-wood and all-steel construction.

In all-steel construction the side-girder car presents advantages, but, as in freight construction, both types will probably persist. The side-girder construction utilizes the greater strength on the side framing without superfluous weight, and it is possible that greater framing strength may prove necessary. With equal strength of side framing the side-girder car may be made lighter than the center-girder type, and the weight of steel passenger cars is one of the most serious problems to be faced by any railroad not having a level line. American passenger equipment was already excessively heavy per passenger carried with wood construction, and the use of steel has increased this weight from 10 to 20 per cent., which is a most serious matter. Apparently side-girder cars, as so far constructed, have a decided advantage over the center-girder type in their light weight and greater strength in case of accident tending to crush in the side of the car. This will probably lead to the use of this type on roads on which weight is of importance.

In spite of the many advantages of the sheathed car in case of construction and maintenance, it appears that the cost and weight of the additional metal will prevent its extensive use. This question is chiefly one of appearance and convenience, and is of minor importance.

The circular roof has been extensively introduced on steel passenger cars on account of its lightness and simplicity of construction. It has the objection that deck sash ventilation cannot be employed. The Pullman Company while using the clear-story roof have, however, discontinued the use of deck sash ventilation, so that evidently in their opinion this objection is not important. The deck sash is, however, of value in a standing car, and when properly screened is certainly advisable in hot weather, especially when the road is dusty. The Canadian Pacific has compromised on this question and is using a roof of approximately circular form with deck sash. The strength and simplicity of the circular roof are retained with the ventilating qualities of the clear-story type.

The preferable material for inside finish is a matter for future decision. With the ample protection afforded by a steel car against accident, there does not appear to be any objection to wood inside finish on the ground of safety. It is more ornamental than steel and a better insulator. Probably on no question in passenger car design is opinion so divided amongst both railroads and car builders. There is today very little difference in cost, and it certainly appears probable that in the future the tendency will be to adopt steel interior finish, if not entirely, at any rate to a great extent.

The construction of the ends of the cars has received considerable attention, and the strength now usually employed is enormously greater than anything attempted in wood construction.

The floor construction in steel cars is entirely different from that in wooden cars, and is usually of metal covered with a flexible cement. In constructing a sample car for the Canadian

Pacific the writer used in addition an underfloor covered with insulating material, and covered the cement with $\frac{1}{2}$ in. of cork. This car was also exceptionally well insulated at the sides, 2 in. of cork being used next the outside plating. Tests during the past winter have shown that this car is actually warmer than the ordinary wooden car, the same amount of heating surface being used in both types. The floor was tested by taking the temperature of water standing on it in cans, there being no practical difference between the results in the wood and steel cars. The question of insulation is an important one, both in hot and cold weather, and while other insulation might no doubt be equally effective, it is interesting to be able to advise that with proper insulation there is no question of the steel car being satisfactory.

PAINTING OF STEEL PASSENGER CARS.

By C. D. YOUNG,

Engineer of Tests, Pennsylvania Railroad.

A fundamental reason for painting any surface of a passenger car is to protect it from the damaging effects of the air which is more or less loaded with gases and moisture.

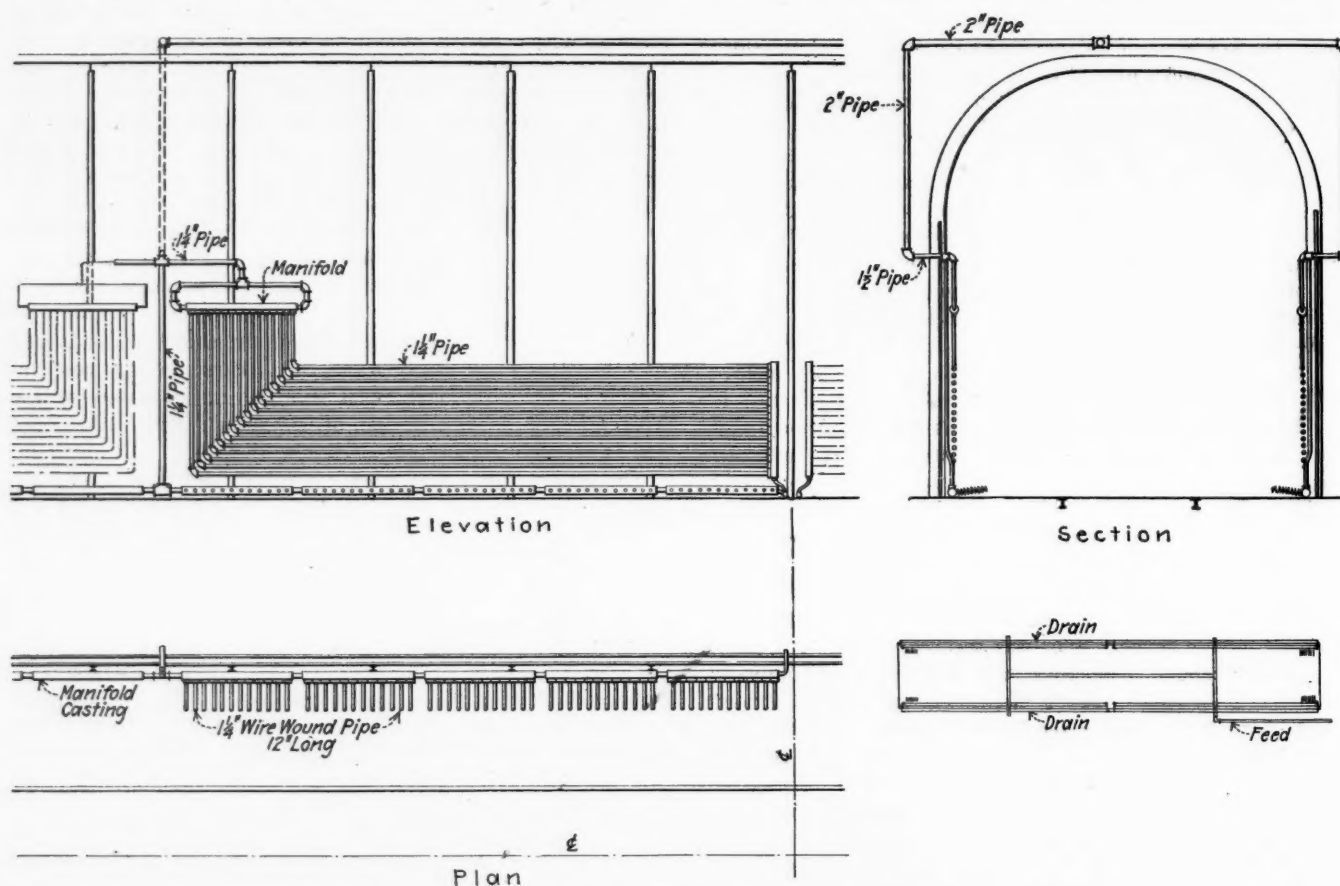
The all important point in the painting of iron or steel sur-

primer. After assembling, all surfaces exposed to view after the body of the car has been placed on trucks, except wheels, must be covered with two coats of truck enamel.

Underframes. During the process of construction all parts of the underframe, including concealed surfaces and surfaces where metal bears on metal, must be covered with two coats of good metal preservative of a non-inflammable nature. All accessible surfaces must be covered with a third coat of metal preservative.

Superstructures. Before assembling all parts made of iron or steel, including the roof, must be covered with one coat of primer. A second coat of primer, properly thinned with turpentine or similar material, must be applied to all surfaces, including those which are concealed when the car is completed. Wherever possible, this second coat must be put on after the sheets are in place.

After assembling, the outside of the side and end sheeting, including letter plate and deck plate, must be covered with one coat of surfacer, the rough and uneven places glazed with "surfacers composition," four coats of surfacer being added, rubbed down with linseed oil and emery cloth, two coats of desired color material added, followed by striping and lettering, then



Steam Piping in Oven for Baking Paint on Steel Cars.

faces is first to have the surfaces thoroughly cleaned and entirely rid of scale and rust, as this is as important as the painting itself. To accomplish this, sand-blasting, where possible, was resorted to, supplemented by the use of wire brushes and emery cloth in the more obscure places and the more uneven surfaces. The sand-blasting, however, was confined largely to the outside surfaces and the latter practices to the inside portion of the car.

The schedule for painting steel passenger car trucks, underframes and superstructures is as follows:

Trucks. Before assembling all surfaces on truck parts throughout, including all concealed surfaces, but not including wheels and axles, must be covered with one coat of suitable

finished with three coats of finishing varnish. The outside of the roof must be finished with one coat of heavy protective paint, followed by one coat of a mixture composed by volume of three parts of mixed ground color and one part of the protective coating used. The top surface and edges of the headlining should be painted with two coats of some preservative, or color paint.

The interior of cars should receive very careful attention in order to produce the desired finish. To illustrate fully the various steps and time taken to complete the painting, the following is given as outlining the progress of the work. This is attained with the use of surfacers, colors and varnishes con-

taining a relatively large amount of artificial driers and varnish gums, in order to obtain the artistic finish desired for the interior.

HEADLINING.

- 1st day.—Apply one coat and stipple after application.
- 2d day.—Stand for drying.
- 3d day.—Apply one coat and stipple after application.
- 4th day.—Stand for drying.
- 5th day.—Apply one coat and stipple after application.

SIDES ABOVE WINDOW SILLS AND ENDS.

- 1st day.—Apply one coat or primer.
- 2d day.—Stand for drying.
- 3d day.—Apply one coat surfacer.
- 4th day.—Necessary puttying and glazing.
- 5th day.—Apply as many coats surfacer as are necessary to make a level surface.
- 6th day.—Same as 5th day.
- 7th day.—Rub down with emery cloth and linseed oil.
- 8th day.—Apply one coat of ground color.
- 9th day.—Apply one coat of ground color.
- 10th day.—Apply one coat of ground color.
- 11th day.—Apply one coat and stipple after application.
- 12th day.—Apply one coat rubbing varnish.
- 13th day.—Stand for drying.
- 14th day.—Apply one coat rubbing varnish.
- 15th day.—Stand for drying.
- 16th day.—Apply one coat rubbing varnish.
- 17th day.—Stand for drying.
- 18th day.—Rub with oil and pulverized pumice stone.

SIDES BELOW WINDOWS.

- 1st day.—Apply one coat or priming.
- 2d day.—Stand for drying.
- 3d day.—Apply one coat surfacer.
- 4th day.—Necessary puttying and glazing.
- 5th day.—Same as 6th day.
- 6th day.—Apply as many coats surfacer as are necessary to make a level surface.
- 7th day.—Rub down with emery cloth and linseed oil.
- 8th day.—Stand, awaiting bringing up other work.
- 9th day.—Stand, awaiting bringing up other work.
- 10th day.—Apply one coat bronze green.
- 11th day.—Apply one coat bronze green.
- 12th day.—Apply one coat of rubbing varnish.
- 13th day.—Stand for drying.
- 14th day.—Apply one coat of rubbing varnish.
- 15th day.—Stand for drying.
- 16th day.—Apply one coat of rubbing varnish.
- 17th day.—Stand for drying.
- 18th day.—Rub with oil and pulverized pumice stone.

RESULTS OF AIR DRYING PAINTS ON STEEL.

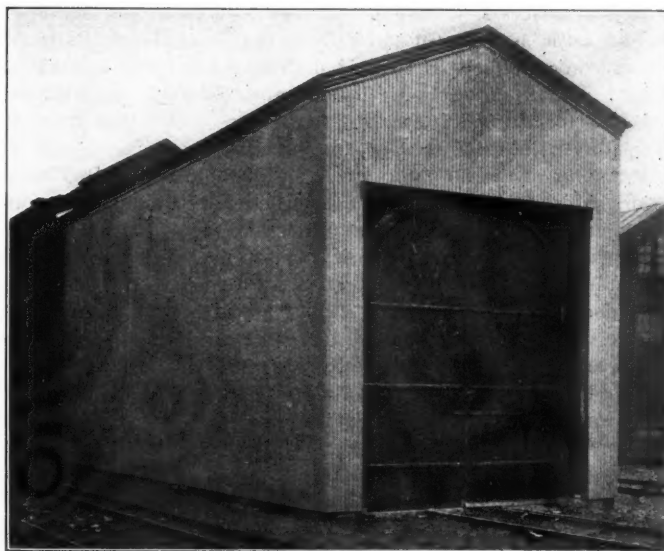
The artificial driers and gums used in hastening the time of drying and hardening of the various coats and permitting the necessary rubbing continue this action so that the paints and varnish increase in hardness and brittleness, rendering them susceptible to cracking and chipping, and the process of disintegration is aggravated by excessive expansion and contraction of the steel surfaces as compared with wood. The linear expansion of steel being more than twice that of wood would seem to indicate the use of more elastic coatings than formerly used for wooden cars.

This fact has been borne out in the service of the paint in a great many cases in an investigation which recently came under my observation. It was noticed that when some of the equipment had been in service about four months, the interiors of the cars showed varnish cracks and checks. As time went on more cars gave evidence of this deterioration, the final outcome being that an investigation was made to see how serious the condition was. Some 400 cars were carefully examined, special attention being paid to choose cars built by various manufacturers, where different makes of surfacers and varnishes were employed. An endeavor was also made to determine whether the cracking of the painted surfaces was confined to the varnish coats or the surfacer coats, or both. In order to classify the various conditions found, four readings of percentages were arbitrarily taken, the condition of a new car being taken at 100 per cent.:

Per cent.	Condition of Varnish and Surface.
90 to 80.....	Good, no checking
80 to 70.....	Fair, slight checking
70 to 60.....	Medium, considerable checking
60 to 50.....	Poor, checked from outside varnish coat to metal

Sample cars were selected to illustrate these various classes, and photographs were taken of the different defective surfaces so as clearly to indicate to the eye what the different percentages meant.

The result of this examination showed that the exteriors, including the sides, ends and vestibules, were in fair condition. There were a few exceptions to this, but they amounted to less than 6 per cent. of the total having serious varnish and surface cracks. Interiors were found generally to be in a poor condition. About 80 per cent. of the equipment examined had the



Exterior of Oven Used for Baking Paint on Steel Cars.

varnish checked through to the surfacer. Some of these conditions developed after four to eight months' service, indicating either that an entirely new system of painting would be necessary to overcome these troubles, or that a more elastic paint would have to be used for interior finishing under the present existing practice of painting steel.

To obtain some data indicating what should be done to meet the conditions, preliminary experiments were made by painting a number of panels and baking them in a heated oven. Repeated experiments along this line indicated that artificial driers could almost, if not entirely, be eliminated in the paint formulae



Steel Car in Oven.

and that more elastic materials could be used without the aid of artificial oxidizing agents. It was also observed that the elastic varnish used on the exterior of the cars could, under this system, be used to advantage on the interior, and by the aid of the heat of the oven they could be dried to the desired hardness, permitting the rubbing with oil and pumice to get the "flat finish." The outcome of the experiments indicated that it would be desirable to extend the experimental panels to a full size car and, therefore, a proper baking oven was planned that would accommodate one of the largest existing steel passenger cars for the purpose of baking each coat as applied to the exterior and interior surfaces.

This oven, as designed and built by the Pennsylvania Railroad at its Altoona shops, is 90 ft. 3 in. long, 13 ft. wide and 15 ft. high. The framework of the structure is made up of 3-in. I-beams for the sides, spaced 5 ft. centers. The roof framing is made of the same sections and curved to conform closely to the contour of the car roof. Each end of the oven has two large doors which may be readily opened and closed. The oven is lined on the inside with $\frac{1}{8}$ -in. steel plate, and on the outside with galvanized iron of 0.022 in. gage. The 3-in. space is filled with magnesia lagging, thus effecting the needed insulation. The doors are insulated in a similar manner. Along the walls of the interior of the oven are placed 16 rows of $1\frac{1}{2}$ -in. steam pipes, and along the floor, close to the walls, are arranged manifold castings with small lengths of pipe tapped into them at right angles. By this means over 2,000 sq. ft. of heating surface is provided. A steam pressure of approximately 100 lbs. to the square inch is used, thus making it possible to get an oven temperature of over 250 deg. Fahr. Rectangular openings, made adjustable, are provided on the sides near the floor line, allowing the necessary admission of air for circulation. Four 8-in. Globe ventilators are spaced at equal distances in the roof and are provided with dampers to regulate the size of the opening. By this means of ventilation, fresh air, which is required for the proper drying of paint, is obtained, as well as providing for the egress of the volatile matter present. Automatic ventilation and steam regulation have not, at the present time, been applied, but these have been considered advisable, if the result of the experiment seems to warrant a more extended application of the practice. A track is placed on the floor of the oven and connected at each end of the oven with other tracks leading into the regular paint shop where the different coats of paint are applied to the car before each baking operation.

BAKING PAINT ON STEEL.

The method of painting a car in this oven is briefly as follows: First, a priming coat is given the exterior and interior of car, which is then moved into the oven and baked for three hours. The temperature at the start is about 160 deg., but rapidly rises at about 1 deg. per min. until a temperature of 250 deg. is reached, requiring about $1\frac{1}{2}$ to 2 hours. The oven is held at this temperature until the lapse of 3 hours, when the car is withdrawn and allowed to cool sufficiently to work upon, after which the surfaces are glazed and depressions and uneven places puttied. The car then receives its first coat of surfacer, is returned to the oven for 3 hours, baked and removed for additional coats which vary from two to three in number as the needs of the case require.

TABLE 1.—TIME SCHEDULE FOR PAINTING EXTERIOR AND INTERIOR OF STEEL PASSENGER CARS.

Period of Work.	Outside.			Inside.		
	Body.	Roof.	Trucks.	Body Above Window Sills.	Head-lining.	Body Below Window Sills.
1	1st prime	1st prime	.....	1st prime	1st prime	1st prime
2	Glaze	.....	.....	Glaze	Glaze	Glaze
3	1st surface	.....	.....	Rub-ground	Rub	Rub
4	2d surface	2d prime	.....	.....	.....	.....
5	3d surface	.....	.....	.....	.....	.....
6	Rub	.....	.....	.....	.....	.....
7	1st tuscan	3d prime	.....	2d ground	1st green	1st green
8	2d tuscan	.....	.....	Stipple	.....	.....
9	Stripe and letter	.....	.....	.....	.....	.....
10	1st varnish	.....	Truck	1st varnish	.....	2d green
11	2d varnish	.....	Color	2d varnish	.....	.....
12	3d varnish	.....	.....	3d varnish	.....	1st varnish
13	.....	.....	.....	Rub	2d green	.....
					air dry	

After the last coat of surfacer has been applied and baked, the outside surface of the body of the car is rubbed down with emery and oil to produce a flat and smooth surface. The various color coats used, such as tuscan red on the outside, pale green, bronze, and bronze green on the inside, are then put on. Two coats of each color are required to get standard shades. Each coat of color is likewise baked.

The car then receives the required lettering, striping, etc., after which the outside and inside surfaces get three coats of a high grade finishing varnish, especially adapted for the baking process. Each coat of varnish is baked at a temperature from 120 deg. Fahr. at the start to 150 deg. Fahr., which is maintained until the expiration of 3 hours. The interior surfaces of the car are then rubbed with pumice and oil, giving the "flat finish" effect desired, thus completing the painting of the car. To illustrate better the schedule of operation followed, or the timing of the various coats, both for the outside and inside, to secure the most economical conditions, Table 1 is given.

All of the work done by the baking process of painting may be accomplished in six to eight days, thus effecting a saving in time of about ten days as compared with the standard or present air drying system. Further, the paints and varnishes have been worked up so that they are especially adapted for this baking process, having greater elasticity. Exact formulae for the various mixtures are well defined, so that uniformity in material is expected, thus giving greater durability, better appearance and longer life for the paint work.

The checks and cracking previously found will be considerably lessened, if not almost removed. By oven painting the work is done under more uniform conditions, which at the present time are so hard to control. It enables the surfaces of the car to be heated uniformly and dried thoroughly, thus removing any objectionable moisture before the first priming coat is applied, which is a very desirable feature of the new method.

A considerable saving will be effected by the shorter time that cars will be held out of service when undergoing repairs and repainting in the shops. It is expected that dirt, soot, etc., will not adhere or imbed themselves so readily and that the general appearance of the car will be improved.

This oven was placed in service the early part of this year and the results of the complete car at this time seem to justify the experiment. They seem to indicate that the results obtained from a small panel can be duplicated in the full size passenger equipment car and that, if this is the case, this method of painting can be used to advantage not only for the painting of steel passenger equipment cars, but for the painting of any other full size steel structure of a similar character where protection and finish are desired.

Results and indications at this time seem to justify our expectations that the new process of baking will give, over the present air drying system: (a) Longer life of material applied. (b) A general appearance as good or better. (c) Less cost of material at no increase in the labor charge. (d) A considerable saving of time for shopping cars, which results in a saving of shop space. (e) Complete sanitation for old cars. These advantages are offset by the initial cost of installation and operating cost of the oven.

TRUCKS FOR PASSENGER CARS.

By JOHN A. PILCHER,

Mechanical Engineer, Norfolk & Western.

Six-wheel trucks. The six-wheel, all-metal truck has the following advantages which make for its selection over other types: It is non-inflammable. It provides a strong material to resist the heavy loads, and occupies only a limited space. It provides a durable material. It reduces the axle loads, and the unit load on the bearings, lessening the liability to hot boxes, reducing the pressure on the brake shoes, lessening the tendency to heat the wheels and shoes, adding to the life of the brake shoes, and reducing the frequency between renewals and adjustments. It spreads the heavier loads over a greater area of

structure, and brings more points of contact with the rail, reducing the influence of track irregularities on the riding of the car, and in cases of very heavy cars, where the unit pressure between wheel and rail might approximate the elastic limit, reduces the tendency to shell the wheel and roll out the rail, adding to the life of both.

It has been estimated that for a passenger car making 50,000 miles a year, the cost for hauling the car is 5 cents per lb. per year. If the six-wheel trucks weigh 14,000 lbs. per car more than the four-wheel trucks necessary to carry the same car, it means the hauling of 14,000 lbs. additional at a cost of \$700 per year, which brings up a question for vital consideration. While the wheels, brasses, and brake shoes, and other such removable parts may individually have a longer life, there are also more of them in service during the period. Careful comparison would have to be made to determine which has the advantage at this point.

Four-wheel trucks. The four-wheel, all-metal truck is also available in connection with steel cars, and has the advantage of reduced first cost, reduced weight, smaller number of parts to maintain, and if the car is sufficiently light for the unit stress between the rail and wheel to be kept down to a point well below the elastic limit of the material, they should be given serious consideration. The only drawback under these conditions is the possibility of its reduced riding qualities. Its decided advantage in reducing the weight of the train should help to make it a favorite because of the corresponding reduction in the cost of transportation.

Cast-steel vs. riveted wrought-steel frames. The cast-steel one-piece frame has become a great favorite even in the face of the high unit cost of these castings. The adaptability of the castings to the various changes of form and section necessary on account of the limited available space has no doubt had much influence. The attractiveness of the one-piece structure, eliminating all joints, and furnishing a frame ready set up, is another strong argument in its favor. The manufacturers having control of this cast-steel truck frame have evidently been successful in reducing to a minimum the concealed flaws often met with in steel castings. This, no doubt, has added largely to its popularity.

While the absence of riveted joints and the consequent doubling of material at the joints helps to keep down the weight, the fact that the working fiber stress of cast steel is low, and the sections at many points have to be made larger than is necessary on account of foundry limitations, the weight of the frame as a whole is great. This added to the large unit cost for special steel castings makes the user pay well for the advantages gained.

The riveted wrought-steel frame seems to have been held back in its development by the success of its rival in cast steel. Many users have shown conservatism in making use of the good thing already considered acceptable, hesitating to try out the different construction with the hope of lower first cost, with less weight, and equally good service. Wrought steel at a very moderate unit cost has the advantage of a very reliable material which can be worked to a relatively high fiber stress. The cost of fabrication, when the work is done in any large quantity, when added to the cost of material, will still leave a large margin in its favor. Is it possible that the lack of a specially interested advocate has prevented its virtue from becoming prominent, and delayed the experience needed to prove, in actual service, its worth? We find that practically all of the prominent car builders have already worked up designs for wrought-steel trucks, and are ready to construct them if the purchaser so desires, but they do not seem inclined to push them, as they evidently offer no special inducement to their own advantage.

Experience of several years of careful comparison of the cost of maintenance will be needed to say whether the one-piece cast-steel frame, or the riveted wrought-steel frame truck would be the most advantageous, when both the first cost and weight could be considered along with the cost of maintenance.

Wheels. For passenger service, the wheels have been practically narrowed down to steel tired wheels and wrought-steel wheels. The steel tired wheels have been of many forms of centers and fastenings; the latest recommended practice of the Master Car Builders' Association is that the tire be shrunk on and bolted. The recent development of the solid wrought-steel wheel has made available for passenger car service a wheel equally as safe and durable as the steel tired wheel at a very much reduced cost.

Axles. For passenger service we would recommend the use of from 60 to 75 per cent. of the loads used in freight service on M. C. B. axles, based on the light weight of the car, and limiting the load to about 90 per cent. of that in freight service, considering the weight of both car and lading. The lighter rating is, of course, to be taken for cars such as baggage and express, since the increased weight on account of lading would be heavier, while the higher rating could be taken for coaches, and similar cars where the increase of the lading would be light.

The Postoffice Department has limited the maximum load per wheel for postal cars to 15,000 lbs. when using 5 in. by 9 in. journals, and to 18,000 lbs. when using 5 in. by 10 in. journals, making a further limitation based upon 18,000 lbs. as the maximum brake load for any one cast-iron brake shoe under emergency conditions of brake application. This limitation of wheel loads, after deducting the weights of the wheels and axles, allows a pressure of 304 lbs. per sq. in. projected area on the 5 in. by 9 in. journals, and 300 lbs. per sq. in. projected area on the 5½ in. by 10 in. journals, also a pressure of 1,522 lbs. per lineal in. on the 5 in. by 9 in. journals, and 1,665 lbs. per lineal in. on the 5½ in. by 10 in. journals; from the experience that some roads have had these seem to be just as high as should be allowed.

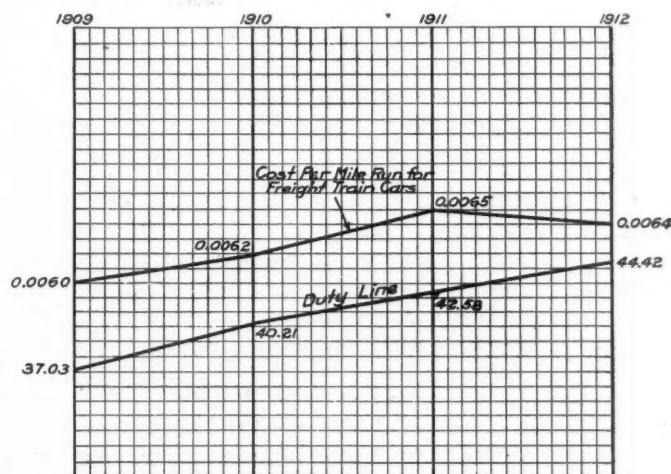
(To be continued.)

MAINTENANCE COST AND DUTY PERFORMED BY FREIGHT CARS.

By J. C. FRITTS,

Master Car Builder, Delaware, Lackawanna & Western.

One of the largest of the many items that enter into the expense incident to railroad operation is repairs to freight train cars; this expense in sum total is increasing from year to year.



Showing Comparative Trend of Maintenance Cost and Duty Performed by Freight Cars on the Delaware, Lackawanna & Western.

It has been claimed that it has increased in a proportion far in excess of the work performed by such cars, the work referred to being considered only from a standpoint of tons carried per car. This, it would seem, is not correct, although it is obviously of interest to know whether the duty performed by freight car

and that more elastic materials could be used without the aid of artificial oxidizing agents. It was also observed that the elastic varnish used on the exterior of the cars could, under this system, be used to advantage on the interior, and by the aid of the heat of the oven they could be dried to the desired hardness, permitting the rubbing with oil and pumice to get the "flat finish." The outcome of the experiments indicated that it would be desirable to extend the experimental panels to a full size car and, therefore, a proper baking oven was planned that would accommodate one of the largest existing steel passenger cars for the purpose of baking each coat as applied to the exterior and interior surfaces.

This oven, as designed and built by the Pennsylvania Railroad at its Altoona shops, is 90 ft. 3 in. long, 13 ft. wide and 15 ft. high. The framework of the structure is made up of 3-in. I-beams for the sides, spaced 5 ft. centers. The roof framing is made of the same sections and curved to conform closely to the contour of the car roof. Each end of the oven has two large doors which may be readily opened and closed. The oven is lined on the inside with $\frac{1}{8}$ -in. steel plate, and on the outside with galvanized iron of 0.022 in. gage. The 3-in. space is filled with magnesia lagging, thus effecting the needed insulation. The doors are insulated in a similar manner. Along the walls of the interior of the oven are placed 16 rows of $1\frac{1}{2}$ -in. steam pipes, and along the floor, close to the walls, are arranged manifold castings with small lengths of pipe tapped into them at right angles. By this means over 2,000 sq. ft. of heating surface is provided. A steam pressure of approximately 100 lbs. to the square inch is used, thus making it possible to get an oven temperature of over 250 deg. Fahr. Rectangular openings, made adjustable, are provided on the sides near the floor line, allowing the necessary admission of air for circulation. Four 8-in. Globe ventilators are spaced at equal distances in the roof and are provided with dampers to regulate the size of the opening. By this means of ventilation, fresh air, which is required for the proper drying of paint, is obtained, as well as providing for the egress of the volatile matter present. Automatic ventilation and steam regulation have not, at the present time, been applied, but these have been considered advisable, if the result of the experiment seems to warrant a more extended application of the practice. A track is placed on the floor of the oven and connected at each end of the oven with other tracks leading into the regular paint shop where the different coats of paint are applied to the car before each baking operation.

BAKING PAINT ON STEEL.

The method of painting a car in this oven is briefly as follows: First, a priming coat is given the exterior and interior of car, which is then moved into the oven and baked for three hours. The temperature at the start is about 160 deg., but rapidly rises at about 1 deg. per min. until a temperature of 250 deg. is reached, requiring about $1\frac{1}{2}$ to 2 hours. The oven is held at this temperature until the lapse of 3 hours, when the car is withdrawn and allowed to cool sufficiently to work upon, after which the surfaces are glazed and depressions and uneven places puttied. The car then receives its first coat of surfacer, is returned to the oven for 3 hours, baked and removed for additional coats which vary from two to three in number as the needs of the case require.

TABLE 1.—TIME SCHEDULE FOR PAINTING EXTERIOR AND INTERIOR OF STEEL PASSENGER CARS.

Period of Work.	Outside.			Inside.		
	Body.	Roof.	Trucks.	Body Above Window Sills.	Head-lining.	Body Below Window Sills.
1	1st prime	1st prime	.....	1st prime	1st prime	1st prime
2	Glaze	.....	.....	Glaze	Glaze	Glaze
3	1st surface	.....	.....	Rub-ground	Rub	Rub
4	2d surface	2d prime	.....	.....	.....	.....
5	3d surface	.....	.....	.....	.....	.....
6	Rub	.....	.....	.....	.....	.....
7	1st tuscan	3d prime	.....	2d ground	1st green	1st green
8	2d tuscan	.....	.....	Stipple	.....	.....
9	Stripe and letter	.....	.....	.....	.....	.....
10	1st varnish	.....	Truck	1st varnish	.....	2d green
11	2d varnish	.....	Color	2d varnish	.....	.....
12	3d varnish	.....	.....	3d varnish	.....	1st varnish
13	.....	.....	.....	Rub	2d green	.....
					air dry	

After the last coat of surfacer has been applied and baked, the outside surface of the body of the car is rubbed down with emery and oil to produce a flat and smooth surface. The various color coats used, such as tuscan red on the outside, pale green, bronze, and bronze green on the inside, are then put on. Two coats of each color are required to get standard shades. Each coat of color is likewise baked.

The car then receives the required lettering, striping, etc., after which the outside and inside surfaces get three coats of a high grade finishing varnish, especially adapted for the baking process. Each coat of varnish is baked at a temperature from 120 deg. Fahr. at the start to 150 deg. Fahr., which is maintained until the expiration of 3 hours. The interior surfaces of the car are then rubbed with pumice and oil, giving the "flat finish" effect desired, thus completing the painting of the car. To illustrate better the schedule of operation followed, or the timing of the various coats, both for the outside and inside, to secure the most economical conditions, Table 1 is given.

All of the work done by the baking process of painting may be accomplished in six to eight days, thus effecting a saving in time of about ten days as compared with the standard or present air drying system. Further, the paints and varnishes have been worked up so that they are especially adapted for this baking process, having greater elasticity. Exact formulae for the various mixtures are well defined, so that uniformity in material is expected, thus giving greater durability, better appearance and longer life for the paint work.

The checks and cracking previously found will be considerably lessened, if not almost removed. By oven painting the work is done under more uniform conditions, which at the present time are so hard to control. It enables the surfaces of the car to be heated uniformly and dried thoroughly, thus removing any objectionable moisture before the first priming coat is applied, which is a very desirable feature of the new method.

A considerable saving will be effected by the shorter time that cars will be held out of service when undergoing repairs and repainting in the shops. It is expected that dirt, soot, etc., will not adhere or imbed themselves so readily and that the general appearance of the car will be improved.

This oven was placed in service the early part of this year and the results of the complete car at this time seem to justify the experiment. They seem to indicate that the results obtained from a small panel can be duplicated in the full size passenger equipment car and that, if this is the case, this method of painting can be used to advantage not only for the painting of steel passenger equipment cars, but for the painting of any other full size steel structure of a similar character where protection and finish are desired.

Results and indications at this time seem to justify our expectations that the new process of baking will give, over the present air drying system: (a) Longer life of material applied. (b) A general appearance as good or better. (c) Less cost of material at no increase in the labor charge. (d) A considerable saving of time for shopping cars, which results in a saving of shop space. (e) Complete sanitation for old cars. These advantages are offset by the initial cost of installation and operating cost of the oven.

TRUCKS FOR PASSENGER CARS.

By JOHN A. PILCHER,

Mechanical Engineer, Norfolk & Western.

Six-wheel trucks. The six-wheel, all-metal truck has the following advantages which make for its selection over other types: It is non-inflammable. It provides a strong material to resist the heavy loads, and occupies only a limited space. It provides a durable material. It reduces the axle loads, and the unit load on the bearings, lessening the liability to hot boxes, reducing the pressure on the brake shoes, lessening the tendency to heat the wheels and shoes, adding to the life of the brake shoes, and reducing the frequency between renewals and adjustments. It spreads the heavier loads over a greater area of

structure, and brings more points of contact with the rail, reducing the influence of track irregularities on the riding of the car, and in cases of very heavy cars, where the unit pressure between wheel and rail might approximate the elastic limit, reduces the tendency to shell the wheel and roll out the rail, adding to the life of both.

It has been estimated that for a passenger car making 50,000 miles a year, the cost for hauling the car is 5 cents per lb. per year. If the six-wheel trucks weigh 14,000 lbs. per car more than the four-wheel trucks necessary to carry the same car, it means the hauling of 14,000 lbs. additional at a cost of \$700 per year, which brings up a question for vital consideration. While the wheels, brasses, and brake shoes, and other such removable parts may individually have a longer life, there are also more of them in service during the period. Careful comparison would have to be made to determine which has the advantage at this point.

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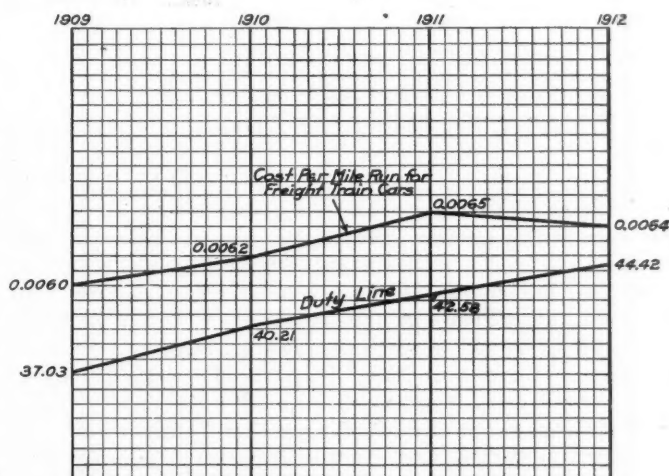
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It has been claimed that it has increased in a proportion far in excess of the work performed by such cars, the work referred to being considered only from a standpoint of tons carried per car. This, it would seem, is not correct, although it is obviously of interest to know whether the duty performed by freight car

equipment is increasing in the same proportion as the expense incident to the maintenance.

It is the practice of railroad statisticians to prepare figures comparing the cost of maintaining freight car equipment from year to year either on a unit basis or on a per-car-mile basis, and it is questionable in either instance if it can be determined from such figures whether the duty performed warrants the increased cost. The unit basis of comparison is of little value. A railroad may spend an average of \$50 per car for maintenance of freight train cars one year, and the following year spend \$60 per car; still the equipment may be performing service that would warrant the increased cost. The cost-per-mile basis is misleading, inasmuch as no distinction is made as to the capacity of cars in service or of the main tonnage.

There are many features that influence the expense incident to car maintenance, and when comparative figures are prepared for the information of those interested, it would seem desirable to show more than the mere cost per unit per annum or per car mile, and that in addition to such figures the duty performed should be given, so that reasons for the increased costs would be apparent.

A 25-ton car will be much less expensive to maintain than a 50-ton car, and roads that make a practice of handling short trains should maintain their equipment cheaper than those where long and heavily laden trains are the rule. Therefore, information relating to the duty performed should be as comprehensive as is consistent with existing conditions.

It is realized that if all conditions that enter into the operation of freight train cars were considered in preparing comparative figures, the result would be so complicated that it would be difficult to understand, but it is believed that the three principal items that enter into the matter of duty performed by car equipment should be considered, i. e., car mileage, car capacity, and average tons per train.

The diagram indicates the cost per mile per car for maintenance for the calendar years 1909 to 1912, and also the duty performed by the equipment during the same period, on the Delaware, Lackawanna & Western. The formula used in obtaining the figures shown by the "Duty Line" is as follows: Average mileage per car multiplied by the average capacity per car multiplied by the average train tons divided by 4,000,000. (The figure 4,000,000 has no significance; it is merely used to reduce the result to a figure more easily handled.) The result shows that, while the cost per car mile for repairs has increased 6.6 per cent., the duty performed by the car equipment has increased in the same period 19.9 per cent.

AUTOMATIC STOPS AND AUDIBLE SIGNALS.

The New York, New Haven & Hartford, which a few weeks ago announced that two automatic stops were to be tried on the lines of that company, advises that the two devices referred to are those made by the Union Switch & Signal Company, Swissvale, Pa., and by the International Signal Company, New York. In connection with this announcement it will be of interest to review the general situation, as regards progress in the matter of automatic stops. The following notes summarize the principal news items which have appeared since the issue of the *Railway Age Gazette* of September 20 last, when a list was given of the roads on which experiments were being made. In the present account, we are including the audible distant signal of the Federal Signal Company, as this device is designed to perform substantially the same function as that fulfilled by the automatic train stop.

The account published in September, page 506, contains the names of ten roads on which automatic stops are in regular use. These ten are the Boston Elevated; the Erie; the Great Western of England; the Hudson & Manhattan; the Interborough, of New York; the Long Island; the Pennsylvania; the Philadelphia Elevated; the San Francisco, Oakland & San Jose;

and the Washington Water Power Company. The Erie must now be taken out of the list of roads on which automatic stops are in regular operation, as the overhead stops which were in use on that road for several years have been taken out of service. On the portion of line where this apparatus was used, automatic block signals have lately been installed; and it was not deemed advisable, in this location, to rebuild the automatic stop apparatus so as to make it operative in connection with the automatic signals. In connection with the Great Western of England, it should be noted that the number of automatic stops is small; but the number of cab signals in use is considerable.

The Maryland & Pennsylvania is to be added to the list of roads on which automatic train stops are in regular use. The Jones system, made by the Jones Safety Train Control System Company of Baltimore, is now in regular service on that road from Baltimore, through the yards and for several miles northward, and is reported as giving satisfactory service. Nine locomotives are equipped.

The Jones apparatus has been in experimental use for over a year. It is worked by means of an intermittent contact rail. The contact rail is fixed on the sleepers outside of the running rails of the track, and is engaged by shoes depending from the tender truck, one shoe being used for the stopping apparatus, and another for the cab signal. Besides the contact rails fixed at points where the brakes are to be applied, there are separate contact rails for the caution shoe and the stop shoe, the caution rails being placed a sufficient distance in the rear to warn the engineman that he is approaching a stop rail, and giving him an opportunity to apply the brakes before he reaches the stop rail, if the block ahead is occupied. There is also an additional caution rail immediately in the rear of the stop rail, and if the engine is brought to rest with the contact shoe touching this rail, a proceed signal will be given as soon as the track ahead is clear. This prevents the operation of the automatic stop except in cases of emergency.

The cab signal consists of a dial and a miniature semaphore; and there are two electric lights, of different colors, to indicate proceed and stop. The plan provides for a bell to sound whenever a caution rail is passed.

The stop rails and shoes can be so arranged, that if a train is running below a certain speed it can pass the stop rail without operating the automatic valve. This has been installed on this road on only one engine, for demonstrating purposes.

The electric features of the apparatus are arranged on a "closed circuit" plan, so that any interruption of the electric current will operate to give a stop signal and "stop." The arrangement of the circuits on the engine is such that when the block is clear, a current from the track is picked up, through the contact rail, located at the entrance to a block or elsewhere, and substituted for the battery current in the engine circuits, thus maintaining the cab signal and air-brake valve mechanisms in their normal running positions. If the track current is short circuited, as when the block ahead is occupied, the cab signal or the brake valve, as the case may be, is operated by the lifting of the shoe on the contact rail.

The September list referred to above included nine roads on which experiments had been made or were being made, two of these being roads which also appear in the list given in the preceding paragraph. These nine roads are the Canadian Pacific; the Chicago, Burlington & Quincy; the Chicago & Eastern Illinois; the Detroit River Tunnel; the Interborough Rapid Transit Company; the New York Central & Hudson River; the Pennsylvania; the Pennsylvania Lines west of Pittsburgh; and the Staten Island Rapid Transit Company.

On the Chicago & Eastern Illinois, the Miller automatic stop apparatus is nearly ready for use, and will probably be operated experimentally within two weeks or less. The work has been delayed by the floods.

The experiments on the Niagara Falls branch of the New York Central have been finished.

Of roads on which something new has been done since Sep-

tember there are ten. These are the Chicago Great Western; the Cincinnati, New Orleans & Texas Pacific; the Delaware & Hudson; the Delaware, Lackawanna & Western; the Denver, Northwestern & Pacific; the Erie; the Huntingdon & Broad Top Mountain; the Indianapolis & Cincinnati Traction Company; the Maryland & Pennsylvania (see above); and the New York, New Haven & Hartford. It will be seen that the total number of roads represented in these three lists is 26.

Chicago Great Western.—The experimental use of the Gollos automatic stop on this road was reported in the *Railway Age Gazette*, November 1, page 849.

C. N. O. & T. P.—The Buell automatic stop is in experimental use on this road.

Delaware & Hudson.—An audible signal, made by the Federal Signal Company, is being installed near Troy, N. Y. It is the outcome of the proposal made by Mr. Cade last autumn, and noticed in the *Railway Age Gazette* of September 27, pages 562 and 569. It is an audible distant fixed signal designed to give an alarm loud enough to command the attention not only of the firemen (in case the engineer is incapacitated) but also the conductor and all other persons on the train. In a box located at and connected with the distant semaphore (or, in the case of three-position signals, with the caution indication) there is a magazine of 104 very loud torpedoes. These are fixed within the box in a movable frame in such a way that the frame, when released, as the signal goes to the caution position, will fall by gravity; and in falling it will actuate successively four hammers, at intervals of a half second, each hammer exploding a torpedo. Thus the magazine, it will be seen, contains a supply for twenty-six operations. As the engine enters on the track circuit which begins at this signal it de-energizes a track relay; and the dropping of the relay armature is arranged to so affect the magazine that it will fall. But it is the duty of the engineer to prevent this operation, by another operation, carried out by means of a short electrical conductor and a third rail, fixed at the side of the running rail of the track. The engineer, by depressing a movable member on the engine, and thereby making electrical connection between this short rail and the running rail, prevents the audible signal from going into operation. The lever by which the engineer performs this cutting-out operation is so arranged that he cannot move it until he has first shut off steam (or applied the brakes, or both, as may be deemed desirable). Being alive and attentive to the visual signals, he will habitually cut out the audible signal, and it should never be called into operation. In other words, if the apparatus is maintained properly and the engineer never fails, the signal will never sound. With such an arrangement, regular tests will be made to give assurance that the apparatus is in working order. Additional details of this scheme are described or suggested in the article referred to above, but these have not yet been sufficiently developed to be further described at the present time.

Delaware, Lackawanna & Western.—On this road an experimental installation of the International automatic stop is being made. This was briefly described in the *Railway Age Gazette* of December 27, page 1273. The fixed or stationary ramp used in this system is about 20 ft. long and its upper surface is about 5 in. higher than the top of the track rail; it is placed from 12 in. to 18 in. outside the track. In the case of an engine moving in the direction opposite to the current of traffic, the plunger is not lifted by the ramp. The other roadside member, the one which is controlled by the condition of the track ahead, consists of a horizontal arm, supported on a post about 19 in. above the rail. The post is set 3 ft. 7 in. outside the track. The arm moves around in a horizontal plane. Mr. Webb proposes to arrange the air valve so that, when opened, it cannot be again closed by the engineer until he stops his train and descends to the ground. He also proposes another arrangement in which the engineer may close the

valve, provided the speed of his train has been reduced to a pre-determined rate, and, also, a third scheme, so arranged that the engineer may close the valve at once; that is to say, he will be allowed at all times to use his own judgment in the regulation of speed, after the air valve has been opened by the stopping apparatus, the opening having given him an audible warning.

The Federal Signal Company's audible signal will also be tried on the Lackawanna.

An automatic stop recently brought out by the Union Switch & Signal Company is to be tried on this road. It is a mechanical trip apparatus, and will be arranged to operate under limitations regulated by the speed of the train. If, for example, a train passes a distant signal at an excessive speed, it will be stopped at a certain point beyond; while, if the speed at the distant signal is within the prescribed limit, the stopping apparatus will not go into effect. The engineer, therefore, finds the same condition that is found by the motorman on the trains in the Interborough subway, where speed-control apparatus is applied to a succession of signals, with automatic stops, located at very short intervals, approaching the stations on the lines where the express trains have to be run less than two minutes apart, and so must "close up" at the stations. As long as he obeys the speed limit rule, he finds clear signals ahead of him, if the section ahead is clear; but if he exceeds this limit he is stopped, because he reaches the next stopping point before the automatic stop has been made inoperative by the time-limit apparatus.

Denver, Northwestern & Pacific.—An apparatus made by B. F. Wooding has been used on this road for several months. Its peculiar characteristic is the contact rail, lying alongside the running rail. It is a comparatively thin blade, placed vertically. It is covered by another rail lying alongside and pressed against it by springs. This second rail, in section, is in the shape of an inverted L, pivoted at its lower edge so as to turn on an axis parallel to its length. The short member of the L protects the fixed rail from ice and snow. The member carried on the locomotive passes between these two rails, pushing the cover-rail to one side, and thus makes electrical contact with both the fixed rail and the cover, throughout their length. The contact rail is not straight, but for a part of its length bends away from the track; and by means of this change of direction, which gives a slight sidewise movement to the member depending from the engine a mechanical as well as an electrical effect is produced on the engine.

Erie.—Preparations are being made for an experimental installation of the induction apparatus of H. D. Patterson of New York. Mr. Patterson puts the primary of a transformer on the engine and the secondary is fixed on the roadbed. There is nothing movable on the ground.

Huntingdon & Broad Top Mountain.—The experiments of the Safety Block Signal Company on this road were described in the *Railway Age Gazette*, January 31, page 216.

Indianapolis & Cincinnati Traction.—The dispatcher's manual block system, with cab signals, made by the Northey-Simmen Company is in use on this road, and in connection with it there is an experimental installation of automatic stops. (Five other electric roads have contracted for the Simmen cab-signal and dispatching system.) An account of the Simmen apparatus, with some illustrations, was given in our issue of September 20, last, page 516.

New York, New Haven & Hartford.—The apparatus of the International Signal Company and of the Union Switch & Signal Company, noted above, are both to be tried on this road.

Pennsylvania Lines West of Pittsburgh.—The Gray-Thurber apparatus, installed on this road some time ago, has been changed in some of its details and will be tested within the next few weeks. The automatic stop of the Union Switch & Signal Company is to be tried also on this road.

NATIONAL VALUATION CONVENTION URGED.

Concerted Action Should Be Taken to Make Appraisal of Railways Economical, Intelligent and Just.

By H. BORTIN.

On March 1 the United States Senate passed a federal valuation act which had been passed by the House, and which was signed by the President the same day, and thus became a law. Compliance with this act will involve an expenditure of about \$5,000,000 by the Interstate Commerce Commission, and at least three times as much, or about \$15,000,000, by the railroads of the country, during the next three to five years, depending on the degree of thoroughness and accuracy with which the work of valuation shall be done.

The above estimates, although based on the cost of similar work done by state railway commissions and railroads, are, nevertheless, susceptible of considerable increase or decrease, depending on considerations to be treated below. To be more specific, it may be said that instead of this work costing \$5,000,000 and \$15,000,000, it might be made to cost either \$3,000,000 and \$9,000,000, or \$6,000,000 and \$18,000,000, according to the amount of preliminary study and investigation given to the subject, and the efficiency and experience of the organizations formed to do the work, as well as on the adaptability of the organizations to this kind of work.

The ultimate expense to the government will consist largely of the cost of checking the railroads' figures and re-arranging and re-compiling them for statistical and other purposes, while the ultimate expense to the railroads will consist of many different items, chief among them those for doing field work; making up new maps and profiles; making blue prints of maps and profiles, both for use in the valuation and to be returned to the Interstate Commerce Commission; making computations from data taken in the field, and classifying and compiling them; abstracting information from existing records and compiling it uniformly with that obtained from the field notes; and, finally, checking and summarizing all of the details involved in the above.

The ultimate expense of the foregoing, both to the government and to the railroads, will depend in a large measure on the extent to which existing information is utilized; in the case of the railroads, on the extent to which they utilize the information contained in their records, and in the case of the government on the extent to which it utilizes the information furnished by the railroads.

In an undertaking of this magnitude, which is as yet in a developmental stage, there always exist at least three equal possibilities as to ultimate cost, these being as follows:

(1) A fairly low cost which indicates, and is the result of, thorough preliminary study and investigation, and of an efficient and experienced organization.

(2) A rather high cost which produces quite a marked effect upon all those who have to bear the expense, and which is the direct result of insufficient preliminary study and investigation, and of inefficient and inexperienced organization.

(3) A somewhat moderate cost, that is, a cost which would reflect conditions such as mentioned under each of the above categories; such a cost, for example, as mentioned in the first paragraph of these remarks.

Now, it rests entirely with those who are responsible for the authorization of these expenditures as to which of the above marks the ultimate cost will reach.

The valuations that have been made in a few states have cost the railway commissions making them anywhere from \$10 to \$20 per mile, and the railroads furnishing such valuations to the commissions, two to four times that much, according to the degree of thoroughness with which they have been made, and the amount of field work that has been done. When it is re-

membered that all these valuations were merely reproduction valuations, and therefore involved only a small portion of the work that will be necessary in order to comply with the provisions of the federal valuation act, it will readily be seen that the cost to the railroads might very easily run up to an average of \$75 per mile or more, and the cost to the government to \$25 per mile.

Comparatively few railroads in this country have made valuations, and but a very small part of those that have done so, have had any kind of an organization exclusively engaged upon such work. Therefore, there are only a handful of railroad men in this country who have had any experience in this kind of work and who have kept in close touch with the literature of the subject. Furthermore, they have been so widely scattered that there has been no uniformity in their understanding and interpretation of many of the important elements and factors entering into a valuation.

It is, therefore, of great importance to all the railroads of the country that a definite program be planned and laid out before each road starts out an organization upon this work.

At a recent convention of the National Association of Railway Commissioners, a report was read in which the opinions of the engineers and experts of the various commissions who had made valuations regarding the various elements entering into valuation of public utilities were set out in detail, and it was very manifest that there was a wide difference of opinion regarding most of the important elements. The same condition is true as to the engineers of the various railroads. They differ just as widely regarding certain questions of valuation. It is needless to say that such differences exist as between representatives of the railroads and the experts of the railroad commissions. This clearly shows the urgent need for extensive study and investigation of the different phases of this subject by a national, representative and competent organization.

While it is only intended, in this article, to call the attention of the railroads and the Interstate Commerce Commission in a general way, to the urgent need of the creation of a national valuation committee, or commission, or association composed of men experienced in valuation matters as well as in matters involving a knowledge of economics and of transportation, it might nevertheless be well to point out specifically a few of the many important problems that must be solved in making a valuation. And it might be said right here, that unless most of these problems are solved beforehand—and they are easily susceptible of solution by such a national valuation organization as is here to be recommended—they will be solved individually by the hundreds of railroads making valuations and at an enormous expense; and the final results will differ so widely and radically that when they ultimately come up for adjudication by the Interstate Commerce Commission or by the courts, a large number of them will have to be entirely revised and altered, which will add tremendously to the ultimate cost. Nor is this a mere theoretical statement. On the contrary, it is based on experience which is bound to be repeated unless it is properly guarded against.

Among the most important needs is a uniform definition and interpretation of the following terms, together with the specific enumeration of the elements embraced by each:

Cost of reproduction, new.

Cost of reproduction less depreciation.

Present value.

Original cost.

Actual cost.

Original cost plus additions and betterments.
 Commercial valuation.
 Intangible items.
 Non-physical items.
 Physical items.
 Adaptation, solidification and seasoning.
 Going value.
 Development cost.
 Deficit below a fair return.
 Interest during construction.
 Engineering.
 Contingencies.
 Franchise value.
 Working capital.
 Unearned increment.

In addition to the need for a more or less uniform interpretation of the above terms—where such is possible—it is equally important that questions such as the following be considered and discussed and agreed upon if possible, among these being:

(1) What are to be the basic theories and assumptions that must inevitably be made in undertaking a "reproduction cost" valuation? For example, should it be assumed that in reproducing a road, a partly completed portion will be turned over to operation, or should it be assumed that nothing would be turned over to operation until the entire road is reproduced?

(2) What is to be the dividing line, if there is one, between physical, and intangible or non-physical, items?

(3) How is "depreciation" to be considered in a valuation?

(4) What should be the "program of construction" for "reproduction valuation" purposes, and to what extent is it to be followed in determining sources of material, labor, and freight charges?

(5) How should the construction period during which there will be no revenues from operation be determined for purposes of ascertaining interest and other charges dependent upon the period of construction?

(6) How should apportionment be made of each kind and class of property between the several states and the several sections within the states, as well as between the several accounts embracing each property?

(7) What unit prices should be used? The average for the preceding year or five years or what?

(8) What methods should be used in valuing right-of-way, station and terminal grounds and real estate?

(9) How should government-granted lands and vacated streets and alleys owned or used by the railroads be treated?

There are many more equally important questions which the limitations of this article do not permit mentioning. There is, however, one subject that cannot be properly omitted, and that is the question of forms for field data, for office compilation and for final return to the Interstate Commerce Commission. This matter is of even more urgent and immediate importance.

When it is considered that the above represent only a few of the points that require discussion and interpretation in a "reproduction cost" valuation, and when it is remembered that the "original cost," stock and bond value, and all the other factors called for in the national valuation act will require even more of study, investigation, discussion and interpretation, it will readily be seen how extremely important and urgent is the need for a national valuation organization.

In view of the foregoing the following suggestions concerning an adequate organization, are offered:

First, that each railroad system engaged in working up the information required by the national valuation act appoint two committees, one to be an "advisory committee," and the other a "working committee," the advisory committee to be made up somewhat as follows:

- (1) The chief engineer or his principal assistant.
- (2) The general counsel or one of his principal associates.
- (3) The auditor or one of his principal assistants

(4) The superintendent of motive power and machinery or his principal assistant.

(5) A responsible representative of the executive's or comptroller's office.

(6) The valuation engineer, who should be secretary of the committee.

The working committee to be made up somewhat as follows:

(1) The valuation engineer (above mentioned) chairman.

(2) An assistant in charge of accounting and historical features.

(3) An assistant in charge of engineering department features.

(4) An assistant in charge of stock and bond and securities features.

(5) An assistant in charge of "reproduction" cost valuations "to date" and the working up of all other features in a uniform manner.

The great advantage of an organization of this kind lies in the fact that it would insure thorough and authoritative results and would prevent considerable duplication of interdepartmental work involving great expense.

Second, that a national valuation convention be assembled at a very early date, to be constituted somewhat as follows:

(1) One valuation engineer from each railroad system in the country.

(2) The valuation committee of the American Society of Civil Engineers.

(3) A valuation committee of the American Railway Association.

(4) A valuation committee from the American Railway Engineering Association.

(5) A valuation committee from the National Association of Railway Commissioners.

(6) A valuation committee from the Interstate Commerce Commission.

(7) Those private consulting engineers of the country who have been engaged in the valuation of public utilities.

Third, that a committee of seven, to be made up of one member from each of the seven classes of representatives above described, be given the authority to name temporary officers for the convention and to act as a nominating committee during the course of the entire convention.

Fourth, that everyone attending this convention as an accredited representative come prepared to bring up and discuss in concrete form, all questions that have come up in the course of their valuation experience, particularly with reference to desirable methods and organization for the purposes of this national valuation.

Fifth, that committees be appointed or elected for both the purposes of expediting the work of the convention and for continuing the work for which the convention was assembled; these committees to have their meetings stenographically reported and the minutes issued as bulletins not later than one week after each meeting of each committee is held.

Sixth, that at this convention a permanent organization or association be formed and officers elected. This association to convene again in six months, and annually thereafter.

As previously stated, the limitations of this article do not permit of going into many important details, and therefore it has been the aim and purpose merely to point out in a general way a few of the more important and immediate needs of both the railroads and the Interstate Commerce Commission towards working up a satisfactory program for the economical and efficient prosecution of the federal valuation; and it is hoped that these remarks and the resulting discussion and comment will crystallize into some definite and well thought out action.

The above remarks are written with a full realization that the suggestions contained therein will meet with some opposition from many railroad officials, engineers, experts and others, mostly on the ground that they seem rather novel, which to many people is synonymous with the word impracticable. At the same time it is quite certain that there will be as many more

who, because of their more intimate knowledge of the subject, will agree that there is an immediate need for some concerted action somewhat along the above lines. Of this the writer feels convinced, and the conviction is founded on intimate knowledge and experience gained during three years in which he has been constantly in charge of making valuations, explaining them to railroad commissions, taking an active part at valuation conferences, and keeping in touch with the work done by others through the literature on the subject.

Whether the above suggestions meet with favor or with opposition is of relatively small importance. The main object of this article, as stated before, is to bring this phase of the subject before all those who are vitally interested; and it is hoped that it will bring forth discussion which will ultimately tend towards economy and efficiency.

ARBITRATION OF THE FIREMEN'S WAGE CONTROVERSY.

In the arbitration proceedings at the Waldorf-Astoria Hotel, New York, on Thursday last, W. S. Carter, president of the firemen's brotherhood, began his summing up of the case. He said that those eastern railroads which have not yet put the ten-hour day into effect should be made to do so, if for no other reason than that of uniformity.

Referring to the railroads' statement that the granting of the men's demands would standardize the rates of wages for all the firemen on the roads involved, regardless of the roads' ability to pay the increased rates or the efficiency of the individual men, Mr. Carter said: "We do not ask the same rate of wages for all firemen on these 54 roads. Our demands are based on a scale divided into twelve groups asking for a separate minimum rate for each of the classes of service set forth. The groups are so arranged that the men on the larger engines, having a greater productive efficiency, shall be paid a higher minimum rate than the men on the smaller and less productive engines. Thus it cannot be said that we are asking the same rate for the fireman whose labor is not as productive of revenue as his brother fireman whose efficiency and productive ability is much greater. The scale of wages set forth in the demand is classified according to the weight of the locomotive on drivers which we are emphatically of the belief represents in the most practical and fairest way the productive power to the roads."

Referring to the plea of the railroads that they were financially unable to grant the demands, Mr. Carter said: "I don't know of any other class of employers but the eastern railroad managers who would ask their men to work for less because their balance in the bank was decreasing. The poor or small road generally uses a smaller size engine, and the rate which we ask this commission to award us is based on the size of the engine."

The western roads, he claimed, have always been more liberal in their treatment of labor in wage controversies than the eastern roads. "Nobody has said, up to the present time," Mr. Carter continued, "that our demands are excessive, and we think we have been more than fair in asking for rates slightly less than those that are being paid on the western roads. There has been much criticism directed at the Erdman act method of arbitration by the roads on the ground that it generally resulted in a compromise being effected. Gentlemen of the commission, we do not ask for a compromise in this case; we do not want you to split the difference. If we are entitled to all that we ask for give it to us. I trust to the wisdom and justice of this commission."

In concluding the case for the railroads, on Saturday last, Elisha Lee, chairman of the conference committee of managers, said: "Since these arbitration proceedings started, the situation of the railways has undergone great changes. The most startling of these has been through the floods of the

Middle West. The entire railway system of Ohio and Indiana was practically put out of business for five days. On the Pennsylvania Lines West of Pittsburgh an aggregate of a mile and a half of steel bridge work was washed away, and we understand the New York Central and Baltimore & Ohio will each have to pay out more than \$3,000,000 in repairs to property alone. To repair and replace the railways affected by this disaster will practically wipe out the surplus earnings of many railroads. In other cases dividends will be threatened. The reason is, of course, that all such damage must be retrieved out of current earnings and cannot be charged to capital. There was never a more striking nor more unexpected object lesson of the absolute necessity for a railway company to earn a surplus adequate to protect its credit and enable it to take care of expensive emergencies.

"Since this board was constituted the state of New Jersey has passed a law providing that the cost of all grade crossing removals shall be borne by the railroads alone. To carry the law out fully would cost one company alone \$60,000,000—so it has been publicly stated. A few days ago the state of New York passed an extra crew law—and we understand it was supported by our firemen friends—which is expected to cost the railroads of that state some \$2,000,000 per year. New Jersey followed suit with a similar law expected to cost about \$500,000 per year.

"It has been urged that railway labor should be more highly paid and that to make this possible freight rates should be raised. Without urging the question as to whether the rising costs of materials, wages, and even capital itself, do not justify increasing rates, we can, nevertheless, urge that even this remedy would be no panacea for this circle of increasing railway wages. The move would go on all the stronger. When the public, through commissions, through mandatory legislation or through arbitration under the law, assesses additional payments to be made out of railway revenues, that same public in effect levies an additional tax upon itself—unseen and intangible for the moment, perhaps, but inevitable in its effect. This public little realizes how agencies acting presumably in its behalf are piling up the burdens on the railroads. That public dimly imagines that it is the capitalists of Wall street who are being injured.

"But it is not so. The railway managers of the country are fighting the battle of the public—that public which is entitled to have efficient transportation facilities at reasonable rates. It is entitled to enjoy rates based upon real capital invested. It should pay rates which will yield proper wages to railway labor and a sufficient return upon the capital necessary to provide proper facilities. But this is the fundamental question this board has to answer—it is, indeed, the fundamental problem which the public itself must solve:

"Shall we, in our desire to escape the rocks of both Scylla and Charybdis, steer far away from the possible payment of undue returns upon railway capital that we may be wrecked through arbitrary additions to railway expenses both by legislation as well as by such movements as this, designed, as we believe, to give a class of men more than their proper share of the funds available for the payment of wages?"

The terms of the award will be made known by April 23.

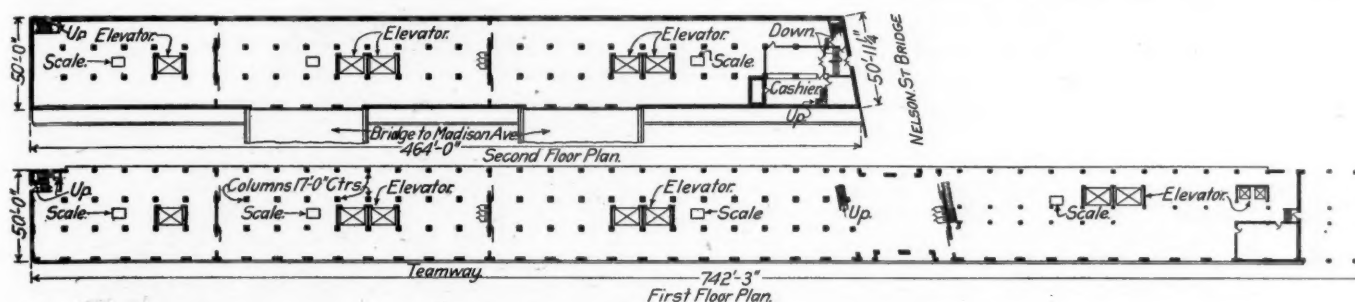
ROME TO NAPLES RAILWAY.—Works are now in progress on different points of the new line from Rome to Naples through Pozzuoli, which it was decided to construct after the government took over the private railway companies in 1905, in order to do away with the present detour through Frosinone, and ensure better communication between the two Italian cities. The total length will be 133 miles, against 155 miles by the existing route, and the total expenditure involved is estimated at \$26,600,000, apart from the \$1,600,000 which will be required for improving and transforming the central station which is located at Naples.

SOUTHERN RAILWAY FREIGHT STATION AND OFFICE BUILDING AT ATLANTA, GA.

The Southern Railway has completed an inbound freight station and office building at Atlanta, Ga., which is of the most modern construction. The building extends for two city blocks, being divided in the center by the intervening street. Consequently it has the appearance of two separate buildings, though as a matter of fact the ground floor, which is on the track level, extends continuously through the two blocks. The building extends along Madison avenue, from Mitchell street to Peters street, being divided by Nelson street above the first floor. The section

livery of freight, ample facilities for the reception of freight for shipment being provided by the company's three outbound freight stations, one located just west of the new building and running its entire length, and the others at convenient points for shippers in different parts of the city. The new station is located in the center of the city, close to the financial and the wholesale and retail business districts, and within easy reach of the main lines of electric railway traffic, the office building fronting on the plaza of the Atlanta terminal station. The grades of the several streets leading from the station are low, and the streets themselves are well paved and not overcrowded with street railway tracks, which is in contrast to the conditions which usually surround freight terminals.

Both structures are built in the latest type of fireproofed con-

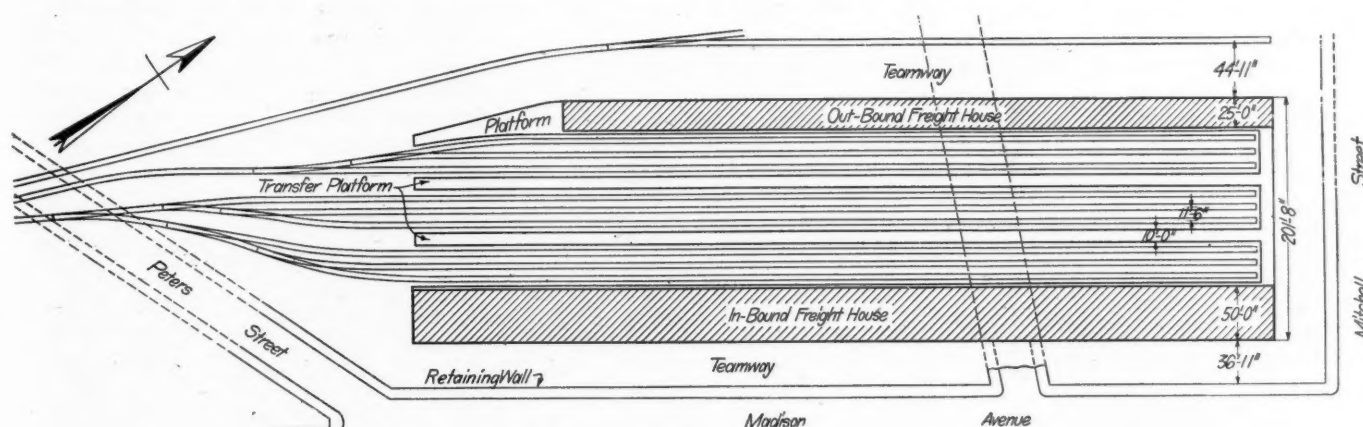


Floor Plans of New Freight Station at Atlanta, Ga.

between Mitchell and Nelson streets is six stories high, and that between Nelson and Peters streets three stories. For convenience the six floor section will be referred to as the office building, and the three floor section as the freight building. Construction work was started on March 21, 1911, and was carried on continuously, the freight building being ready for occupancy on September 1, 1912, and the office building, December 1, 1912. Both sections of the building have been so constructed as to permit the placing of additional floors in the future.

The office building houses the various departments located in Atlanta, including the assistant to president, the assistant freight traffic manager, the general freight agent, the assistant general

struction. The freight building is of reinforced concrete throughout—footings, columns, walls, floors and roof. The office building has a reinforced concrete frame, including footings, columns and floors, the space between the exterior columns and around them being filled with pressed brick. All partitions between rooms are built either of concrete, brick or hollow terra cotta tile. In the freight rooms of the freight building there are brick fire walls at intervals of about 150 ft., the few openings in which are automatically closed in case of fire by rolling doors covered with sheet steel, so as to confine any fire which may break out entirely to one compartment. The many doorways in each freight room required for the rapid receipt and delivery of



Plan of Southern Freight Houses and Track Connections at Atlanta.

freight agents, the assistant general passenger agent, the coal freight agent, the live stock agent, the superintendent, and other traffic and operating officers who have been located in different office buildings. The four upper floors furnish space for these offices, while the two lower floors, that on the track level, and that on the street level are used as part of the inbound freight station. The freight building is given over to freight station purposes, with the exception of portions of the second and third floors, which are used for the offices of the local freight agent and the stationery department.

This inbound freight station is used exclusively for the de-

freight are closed by rolling steel shutters, and the transoms above the doors have steel bar frames and are glazed with wire glass. In both buildings all windows which may be exposed to fire in neighboring structures, such as on the track side and on the Nelson street face have steel frames and sash, and are glazed with polished wire glass. The stair halls in the freight building are entirely disclosed by concrete walls, the stairs are of concrete, the doorways have steel frames and the doors are covered with sheet steel. All freight elevator shafts have steel encased sliding doors. All freight rooms have standard fire plugs connected to the fire mains so that although no part of the structure itself

can burn, every precaution has been taken to restrict any fire which may start in the merchandise stored in the buildings to the room in which it started.

The freight building extends from Nelson street viaduct south towards Peters street viaduct for a distance of 464 ft. It has a width of 50 ft., and is three stories high, the total height above the driveway level being about 47 ft. The lowest or first floor is the one on which all freight will be removed from the cars and transferred to drays on the opposite side of the building. On this side a granite paved driveway having a minimum width of 36 ft. extends from Garnet street on the south, under Nelson and Mitchell streets and the Atlanta terminal station to Madison avenue near Hunter street on the north, which will permit the handling of a vast amount of traffic without undue congestion. Freight may also be carried by any one of the five elevators in the building, each having a capacity of 8,000 lbs., to the second floor where two bridges span the low level teamway just described, and enable vehicles to drive up to the building direct from Madison avenue. Each of these bridges has a width of 65 ft. between curbs, and is paved with creosoted wood blocks on a waterproofed concrete floor.

The entire lower floor of the freight building, and about two-thirds of the second floor are to be used for freight rooms, the total area being slightly over 39,000 sq. ft. The local agent's office will occupy the Nelson street end of the second and third floors, an area of 12,600 sq. ft. The stationer will occupy about half of the third floor, and about a quarter of the second floor, an area of about 18,000 sq. ft. The part of the building which is to be used for offices is finished in oak, and has all the equipment found in modern office buildings of the highest class.

The office building is situated between Mitchell and Nelson streets, having a length of 237 ft., a width of 50 ft., and a total height above the teamway paving of a little over 91 ft. The lower or track level floor, and about three-fourths of the second floor are to be used as freight rooms, the remainder of the building being devoted to office use. The floor area for freight purposes is about 19,100 sq. ft., and that for office purposes about 49,000 sq. ft. The equipment of the freight rooms is similar to that in the freight rooms of the freight building, except that there are but two freight elevators in this building. On the second floor there are two bridges spanning the low level teamway and affording a direct connection with Madison avenue, each having a clear width between curbs of 31 ft., or approximately one-half the width of those of the freight building.

The offices on the second to the sixth floors inclusive are reached either by concrete stairs encased in white Georgia marble, or by two passenger elevators. There are 74 rooms on these five floors, the smallest having an area of 63 sq. ft., and the largest 6,570 sq. ft. The offices are finished in oak, with hardwood floors, and most of the rooms are furnished with telephone, bell and fan outlets, there being the usual general equipment of water

plugs and hose for fire protection, mail chutes, dumb-waiters and tariff carriers.

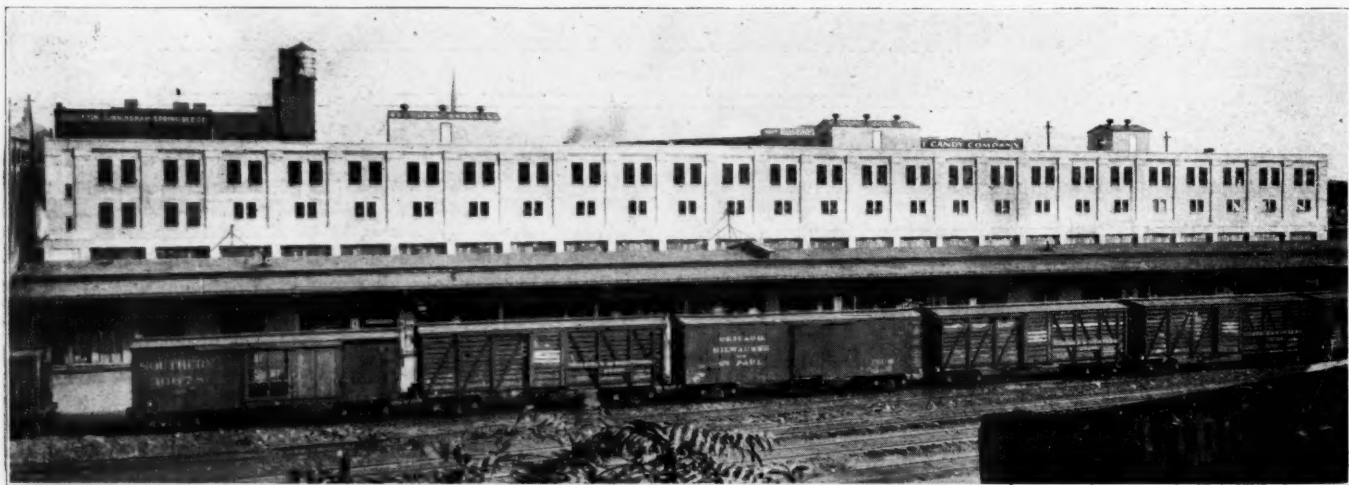
These buildings are lighted by electricity, which is also used for operating the elevators, and are heated by steam, both being supplied by the power plant of the Atlanta terminal station just across Mitchell street from the office building. A power plant to serve these buildings was designed and arrangements were being made to construct it at the Peters street end of the freight building, but it was later considered advisable to postpone the



Mitchell Street End of Office Building.

work for the present, and obtain the light and heat from the Atlanta terminal company, which now serves the outbound freight house and the transfer sheds of the Madison avenue station.

The reinforced concrete of both buildings was designed according to the recommendations of the Joint Committee on Plain and Reinforced Concrete, which are more conservative than the standards used in many examples of this type of construction. The design and construction of these buildings were handled under the supervision of B. Herman, chief engineer of maintenance of way and structures. H. W. Hesselbach was the architect, and H. N. Rodenbaugh, the engineer in charge. R. M. Walker & Co., of Atlanta, were the contractors.



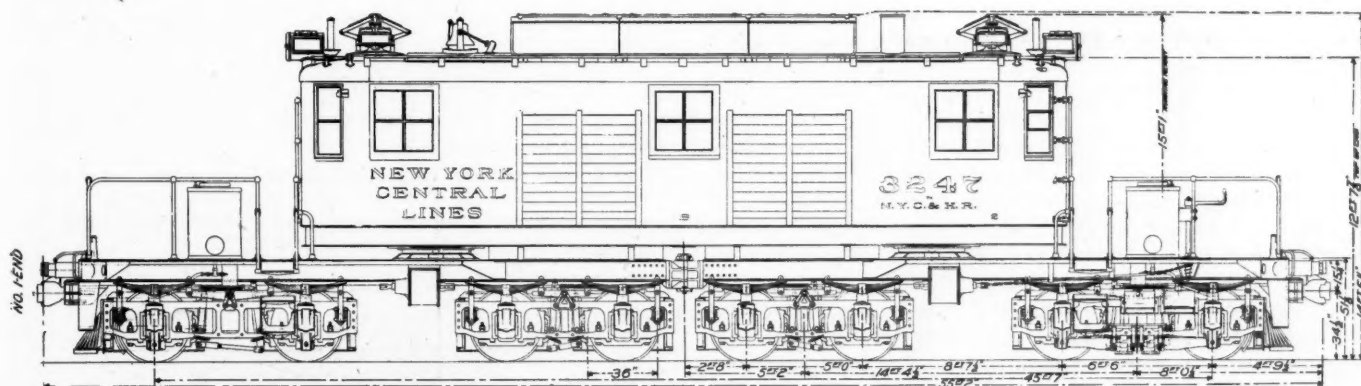
New Inbound Freight Station with Old Outbound Station in Foreground.

ARTICULATED ELECTRIC LOCOMOTIVES FOR THE NEW YORK CENTRAL.

After a series of tests on the Harlem division of the New York Central, an eight-motor articulated, 600-volt direct current electric locomotive has been placed in service on the electrified section at New York and an order placed with the General Electric Company for nine others of the same design.

The locomotives in service up to this time on the New York Central's electric zone weigh approximately 230,000 lbs. Those of the new design are considerably lighter, weighing 200,000 lbs.,

latest step has been the addition of motors to the guiding trucks so that the entire weight is available for adhesion. A still greater separation of the fixed wheel base and the guiding trucks lengthened the machine so as to necessitate constructing the running gear in two sections, with a spring-connected, articulated joint between the frames. The cab is supported on the two parts of the frame on center pins. Each section is equipped with one rigid and one swivel four-wheel truck. The rigid truck is built up of heavy steel castings, the side frames being of a truss pattern. The end frames and center cross frames are steel castings securely bolted to the side frames and supporting the



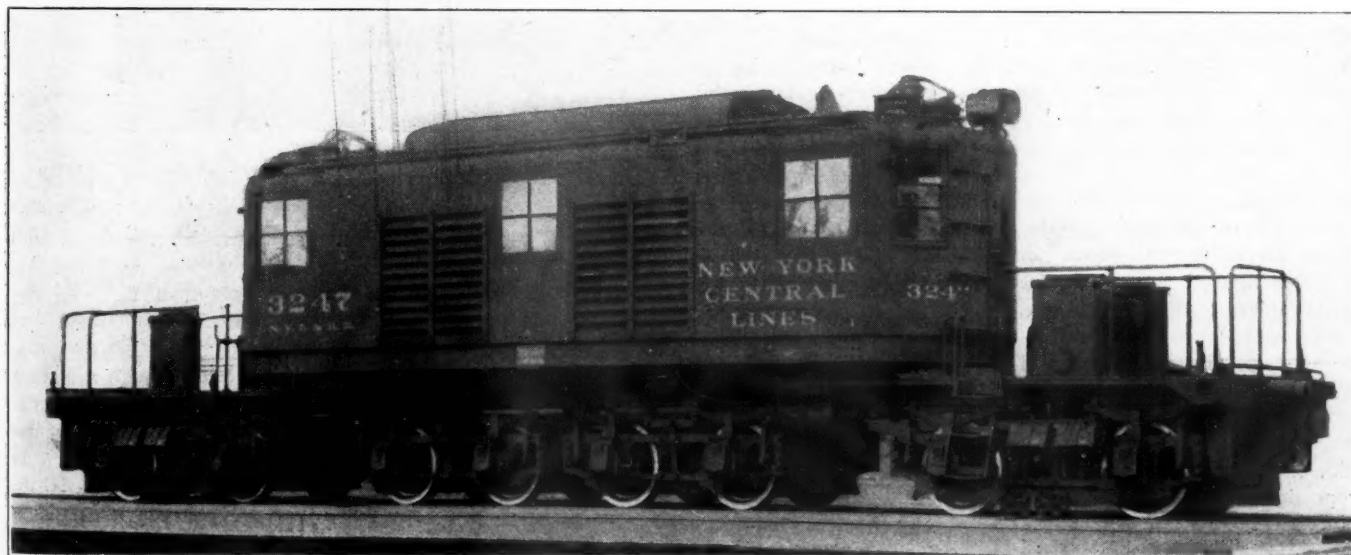
Side Elevation of the New York Central's Latest Type of Electric Locomotive.

but the entire weight is carried on the drivers while in the older type the weight on drivers was only 140,000 lbs. The new locomotives are designed with a view to continuous high speed, and it is claimed they will exert sufficient tractive effort to haul a train weighing 1,000 tons at 60 miles per hour. In regular service they can develop 1,400 h. p. continuously and as high as 5,000 h. p. for short periods.

The original New York Central electric locomotives had a two-wheel guiding truck at either end, with 28,000 lbs. on the

magnet poles. The magnetic circuit of each truck consists of the armatures mounted on the axles, the magnet poles carried on the end frames, the side frames and an additional magnet bar forming a path in parallel with the side frames. The weight is carried on semi-elliptic and coil springs resting on the journal boxes.

The main frame of the locomotive is a box girder built up of 10-in. channels with 1/4-in. top and bottom cover plates. It is 36 in. wide and 22 ft. long and is bolted to the top member of



Electric Locomotive with Articulated Frame Connection and Eight Motors.

axle. There were four pairs of driving wheels, each carrying the armature of a direct current, bipolar, gearless motor. To improve the riding qualities, a four-wheel guiding truck was substituted in a more recent design. A further development in a subsequent type was to increase the distance between the guiding trucks and the rigid wheel base. The riding qualities were improved, but at a loss in the mechanical efficiency of the locomotive; for about 80,000 lbs. were added to the weight on the trucks for the sole purpose of guiding the locomotive. The

rigid truck, extending forward over the center plate of the leading truck and backward to the hinge which connects the two halves of the frame. The main frames carry in their top plates the center pins which support the weight of the cab. These center pins are hollow and serve as air passages, the box girder acting as a distributing reservoir for the air delivered from the blower in the cab to cool the motors. The construction of the swivel or leading truck is similar to that of the rigid truck, except that it is connected by a center pin to the main frame.

While the locomotive has a total wheel base of 45 ft. 7 in., the greatest rigid wheel base is 6 ft. 6 in.

The cab is 35 ft. long and 10 ft. wide and is divided into three sections, consisting of a motorman's compartment at either end and a central section containing the air compressors, blowers, contactors and rheostats, grouped so that they are conveniently accessible for inspection and repair. There is a platform on either end of the locomotive, from which access to the cab is obtained through doors. The field poles of the eight bipolar motors are carried on the truck frames, which form the magnetic circuit. There are four independent magnetic circuits in the locomotive corresponding to the four trucks. The magnetic flux path on each truck passes in series through the fields and armature of one motor, through the center transom and the fields and armature of the second motor to the end frame, and then returns to the starting point through the two side frames and a reinforcing magnet bar lying parallel with the frames. The motor is practically enclosed, and the field coils are waterproofed and armored. Each field coil is wound in a brass shell, the windings being in two decks of flat ribbon copper laid side by side. The outside turn is covered with insulation and an armor of sheet steel is clamped over it, filling the space between the sides of the shell in such a way as to protect the windings from water or mechanical injury. End shields are provided for each motor, which render it dust-tight and as nearly water-tight as is possible in a motor equipped with outlets for forced ventilation.

Each motor at its one hour rating has a capacity of 325 amperes on 600 volts, or a continuous rating of 260 amperes on 600 volts under forced ventilation. For the complete equipment of eight motors, this corresponds to a capacity of 13,500 lbs. tractive effort at 54 miles an hour for the one hour rating, and 10,000 lbs. tractive effort at 60 miles an hour continuously. The motors are electrically connected in parallel permanently, in pairs, and the pairs may be connected in three combinations, series, series-parallel and parallel. They are insulated for 1,200 volts, so that if at any future time it should be desired to operate the locomotive on that voltage, the pairs of motors can be changed from parallel to series connections and the same speeds and control combinations obtained as on 600 volts.

The control equipment is the Sprague-General Electric Type M. The external regulating resistance, divided into four parts, is directly connected, each part to a pair of motors permanently grouped in parallel. The pairs of motors with their respective resistances are connected in series on the first point of the controller. The resistance is varied through eight points and finally short-circuited on the ninth or running point. The pairs are then operated similarly in series-parallel with all resistance cut out on the seventeenth point. Finally all of the pairs are connected in parallel with the twenty-fourth step a running point. This provides a control with nine steps series, eight steps series-parallel and seven steps parallel. The transition between series and series-parallel is effected without opening the motor-circuit, and there is no appreciable reduction in tractive effort during the change. The smooth transition between points, both rheostatic and transitional, permits motor operation close to the slipping point of the wheels. The locomotive weight on the drivers is so proportioned that the motors operate safely up to the slipping point, which serves as a limit to prevent overloading the motors. The transition between all four pairs of motors in series to series-parallel is accomplished by short-circuiting two of the pairs of motors during the instant of transfer. The transition between series-parallel and parallel is effected by means of the standard bridge method. The motor cutout switches are connected so that any pair of motors may be cut out of circuit. The locomotive will operate when a pair of motors is cut out with two groupings of the motors, the first with two pairs of motors in series and the second with three pairs of motors in parallel.

For protection against short circuits all the main fuse boxes are of the copper ribbon type, fitted with hinged covers to facili-

tate fuse renewals. The box is provided with a magnetic blow-out, which is energized by the current passing through the fuse. The main fuse boxes are located as near as possible to the overhead trolley and to the third rail shoes in order to protect the wiring circuits near the source of supply. Each pair of motors is locally protected by a fuse box. The main switch is provided with a blowout so that heavy currents may be opened without damage. An ammeter is located at each engineer's position and records the current in the circuit of one pair of motors. The main motor rheostats are formed of cast-iron grids mounted in a frame and insulated in mica. The rheostat boxes are assembled in the monitor deck of the locomotive.

Current is collected by eight underrunning third-rail shoes, or by two overhead trolleys when on gaps in the third rail. The trolleys are of the pantograph type and are pneumatically operated from either end of the cab by a foot-operated valve. The trolley is held in a raised position only while the valve is held open by the engineer's foot.

The blower set for ventilating the driving motors is located



End View of the New York Central's Electric Locomotive.

in the central compartment of the cab and has a capacity of 24,000 cu. ft. of air per minute; it is driven by a series wound motor of the railway type. The air compressor is two-stage, motor driven with a piston displacement of 100 cu. ft. of air per minute when pumping against a tank pressure of 135 lbs. per square inch. The compressed air, in passing from the low pressure to the high pressure cylinder, is conducted through radiating pipes under the platform of the cab. This reduces the temperature and allows condensation of moisture before entering the high pressure cylinder. From the high pressure cylinder it is delivered into a series of four air reservoirs, each 16 in. x 90 in. These are located under the floor of the cab and are connected in series, to afford further opportunity for radiation and condensation. Leach type L double pneumatic sanders are provided and the bell is fitted with the Sampson automatic ringer. All wiring is drawn through conduits and is carefully protected from mechanical injury.

The principal data and dimensions are as follows:

Length inside of knuckles.....	55 ft. 2 in.
Length over cab.....	33 ft.
Height over cab.....	12 ft. 8 in.
Height with trolley down.....	14 ft. 6 in.
Height with trolley running.....	15 ft. 1 in.
Width over all.....	10 ft.
Total wheel base.....	45 ft. 7 in.
Rigid wheel base.....	5 ft. and 6 ft. 6 in.
Total weight.....	200,000 lbs.
Weight per axle.....	25,000 lbs.
Dead weight per axle.....	6,395 lbs.

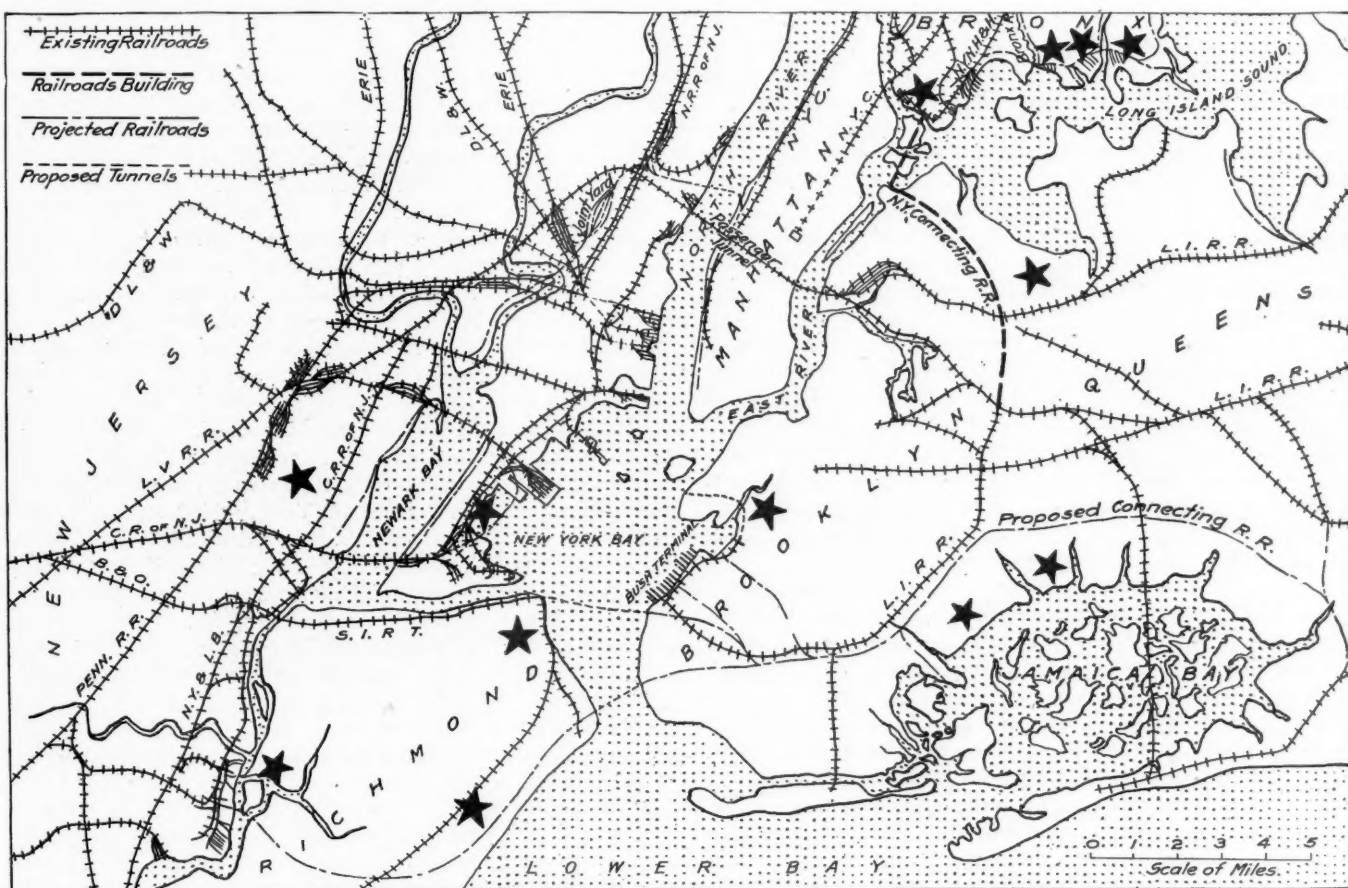
NEW YORK'S FREIGHT TERMINAL PROBLEM.

Necessity for a New Policy, Peculiar Difficulties Encountered and Some of the More Interesting Solutions Offered.

New York has done less to develop its port along modern lines than any other important shipping center in the world and is far behind many naturally inferior ports as regards adequate terminal facilities and cheap and quick means of transportation. The present congestion of traffic and the recognized impossibility of relieving it by the old methods have induced the city and the manufacturers to start a strong movement to bring about the necessary improvements. The difficulty is greatly aggravated by the separation of the port into four parts, viz., the New Jersey section, the Manhattan and Bronx section, the Long Island section and the Staten Island section. Freight communication between these four sections is now only possible by car floats and lighters, and it will not be until they are con-

docks above Twenty-third street, where they would be transferred to the terminals by means of the elevated road, which would be reached by ramps. The plan also includes the construction of tunnels under the Narrows, connecting the borough of Brooklyn with Staten Island, also other terminal developments similar to the Bush terminals at points indicated on the accompanying map by stars.

This plan, if carried out, would give all factories and warehouses in Greater New York direct track connection with all railroads and steamship piers. In its entirety it is on an enormous scale, but it should be remembered that it was not formulated with the idea of showing what was needed in the immediate future, but rather to show the reasonable limit to which the ad-



Proposed Connecting Railroads and Terminal Development Sites for Greater New York.

ected by freight tunnels that the disadvantages of this separation will be entirely overcome.

The situation has been studied and various plans, more or less practicable, have been submitted. The most comprehensive of these was devised by Calvin Tomkins, until recently commissioner of docks for New York City. It provides for the construction by the city of joint railroad freight terminals and warehouses along the east side of the marginal way on the west side of Manhattan, connected by spurs with a proposed four-track elevated railroad which would run along the marginal way to a connection with the New York Central's tracks at Sixtieth street. Tunnels under the North river are also proposed which would connect the mainland with the elevated railroad at some point near Forty-second street. A joint classification yard of large capacity connected with all the New Jersey roads would be built near the entrance to the tunnel on the Jersey side. Until the tunnels were built the cars would be carried by car floats to

vantages of the port could be developed. The purpose of the plan, therefore, is to indicate along what lines improvements should be made to secure the maximum efficiency for both the present and the future.

The advantages and possibilities of terminal development are just beginning to be appreciated. Terminal charges are absorbed in freight rates, and where the terminal facilities are inadequate and the methods antiquated and costly, the terminal charges constitute a large percentage of the freight rates, particularly on short hauls. Railroads have consistently reduced grades, eliminated curves and increased the efficiency of their motive power and rolling stock to reduce their operating costs, but comparatively little has been done to improve the practices at terminals, a field which offers innumerable opportunities for economy. Aside from establishing direct track connections between all warehouses, factories and transportation lines there is the field of handling freight by means of mechanical devices, which has

been so successfully developed abroad and almost utterly neglected in this country. Adequate terminal facilities constitute a most important factor today in attracting manufacturers to a community. It is of great importance, therefore, if a community is to preserve its manufacturing industries, or to attract others to it, that the costs and delays incident to the handling of traffic at its terminals be reduced to a minimum.

The commercial and industrial supremacy of New York is fundamentally due to its unrivaled harbor and its situation at the end of the only level route from the Mississippi valley to the Atlantic seaboard. The result of these advantages is that as a combined shipping and railroad center it has no equal. Owing to the lack of efficiency of the car float and lighterage systems the disadvantages of its insular position have not been overcome. Under the present arrangement cars are brought from New Jersey to the New York piers in the morning, where they are moored and left until evening to be unloaded and reloaded. The freight from the cars is carried to the piers by hand trucks and piled on narrow platforms. Drays call at the piers to remove or deposit the freight; the space for drays is insufficient and congestion results. Where two car floats are placed end on end the hand truck run is 600 ft. The car floats are pulled out late in the afternoon to catch the evening trains and any freight received after that time must wait over until the next day. The railroads are obliged to hold uncalled for freight 48 hours, and this temporary storage increases congestion. The process is slow and expensive. On a conservative estimate the terminal expenses on traffic from New Jersey amount to about \$1.35 a ton.

The problem on the island of Manhattan is not only the most difficult but also the most important. Of all the railroads which reach New York only one, the New York Central, carries freight to its terminals in the city over its own tracks. A very large portion of the west shore of Manhattan is occupied by the terminals and docks of the railroads, which terminate on the New Jersey shore of the North river. This condition has existed for a number of years, and was satisfactory until the growth of railroad and marine traffic necessitated more extensive terminal and dockage space on the water front than was available. This situation made a change of plan imperative. The water front space is the only logical place for the piers of the larger vessels, partly because it is the most convenient for passengers, and partly because the deepest marginal channel runs along the shore. If the steamships were forced away from this locality other channels would have to be deepened at an enormous expenditure and the present deep channel would be wasted because it is not needed for railroad traffic. It is also highly desirable that railroad and shipping terminals be built as near together as possible. To accomplish this Mr. Tomkins suggested that the railroad terminals should be built along the east side of the marginal street. If this idea were carried out the space on the waterfront required by the railroads would be greatly reduced and the sites of their present terminals could be used by the steamship companies. Space on the east side of West street is much cheaper than on the water front, and the increased terminal facilities would permit the roads to handle their freight more economically and with greater despatch.

The terminal buildings would each doubtless occupy a block and the dray approaches and passageways at grade, together with the platforms, would include the entire ground floor; in other words these buildings would be arcaded, standing on columns, and would greatly increase the street surface. The second floor would be on the same level as the elevated railroad and would be used to load and unload freight cars. The third, fourth and fifth floors would be devoted to storage warehouses, and it is planned to use the upper floors for factory purposes. It is believed that the manufacture of many light articles could be attracted from the center of the city to the factories over the terminals on account of the more sanitary conditions and the improved transportation facilities. If this could be accomplished the rentals would serve to reduce the overhead charges. Elevated

car yards would be provided adjacent to the terminals for car storage. The joint terminals would be built and owned by the city and rented to the roads. Individual terminals could also be built by the roads at their own expense.

The four-track elevated railroad would extend from Washington market to a connection with the tracks of the New York Central at the yard of that road at Sixtieth street. It would have spur connections with all the railroad terminals and warehouses, and would be used jointly by all the railroads. It would not be connected with the steamship piers, but instead a system of telpherage over the elevated road is advocated to connect the piers with the warehouses on the other side of the street. When this road shall have been built the surface tracks of the New York Central on Tenth and Eleventh avenues and West street, which have proved so dangerous, may be removed. If four tracks are not sufficient to handle the traffic additional trackage up to at least ten tracks may be provided. Mr. Tomkins believes that to keep West street under complete municipal control, and at all times subject to the city's terminal policy, the city should build and own the elevated structure, contracting with the railroad companies through a joint terminal company, organized by the city, in the ownership and control of which the roads should be permitted to participate on terms of equality. Interest and maintenance charges would be recouped by the city from reasonable rental or service charges. In order to encourage commerce the city should not look for more than the return of interest, maintenance and amortization upon its investment. In this way the improvements would pay for themselves, the bonds would be exempted from the debt limit of the city and there would be no public burden. Public ownership is favored because the money can be secured at a lower interest rate, and also because private ownership involves profits over and above interest and amortization charges.

The car floats would have to dock north of Twenty-third street, so that the cars could be transferred to the terminals in that vicinity at grade. Surface tracks would not be permitted on the marginal street south of Twenty-third street, as they would interfere with street uses. Cars destined for the downtown terminals would be sent via the elevated road, which would be reached by means of ramps near the car float docks.

Tunnels under the North river are proposed to eliminate the long carfloat journeys and to establish direct track connection between all the New Jersey roads and all the terminals on Manhattan. Until the passenger tunnels had demonstrated their practicability, freight tunnels were never seriously considered. It was proposed to connect Manhattan with the mainland by a bridge. The relative merits of the two plans are now under consideration, but no definite conclusion has yet been reached. This track connection is now highly desirable and will before long be of paramount importance if the growing traffic of the city is to be handled quickly, and if the advantage of certain roads over others is to be obviated.

The plan includes the construction of a joint classification yard with a capacity of at least 6,000 cars near the entrance to the tunnels on the Jersey side which would be connected with all the Jersey roads by a belt railroad as shown in the map. The tunnels would most probably be built from a point on Manhattan near Forty-second street to the nearest point on the opposite shore. Two single track tunnels would be built first, one tunnel for each direction; and more could be added as needed. Whether the cost of operation of such tunnels would be low enough to warrant their construction has not yet been determined. As New York City could not build them alone the co-operation of the state of New Jersey would have to be secured. Mr. Tomkins believes that the tunnels should be built and owned publicly, because of the large initial cost, and that they should be used jointly by the roads on payment of rental charges as in the case of the elevated road. It is proposed to ultimately extend the tunnels under the city and under the East river to a connection with the New York Con-

necting Railroad now under construction. When this road, which is being built by the New York, New Haven & Hartford and the Pennsylvania Railroad jointly, is completed, freight from New England will be carried direct to the Bush terminals at South Brooklyn, from which other roads are easily accessible. This will be a big improvement over the present arrangement which involves a long carfloat journey up the East river. It will be the first and easiest step in the connection of the different sections of the port.

New York is both a commercial and an industrial center. It is commercial in that it establishes a connection between different transportation systems, and it is industrial in that a large amount of its traffic either originates or terminates in the community. It is in this latter capacity that most of the development should be made for the industrial function of the city is of far greater importance than is the commercial function. For this reason the classification yards for through and local freight should be separated, and preference should be given to the latter. No freight that is not destined for New York proper should ever enter the island of Manhattan. Terminals and yards for that class of traffic should be built in the outlying districts where land is cheap and where the cars would not impede the movement of local traffic. The manufacture of heavy articles should be attracted away from Manhattan and for this purpose sites have been selected for proposed terminal developments on the waterfront of the various boroughs of the city. These developments would be similar to the Bush terminals at South Brooklyn, and would afford docks of large capacity, warehouses, cheap land, and adequate railroad connections. The stars on the map indicate the sites of the proposed developments.

Mr. Tomkins' plan is vigorously opposed by the Jersey railroads. They contend that the longer carfloat journey and the additional haul to the downtown terminals over the elevated road would increase rather than decrease their expenses. The economy of freight tunnels has not yet been proved and the railroads are skeptical. Thus far their attitude toward the joint operation of facilities has been entirely hostile. The New York Central now sends a considerable amount of its freight from its uptown yards to its downtown terminals by water, on account of the inconvenience and expense incident to the operation of its surface tracks. This road is therefore subjected in a measure to the same handicaps as are the New Jersey roads, and they assert that if the proposed improvements were effected the New York Central would derive the greatest benefit and that its position would be materially strengthened in relation to them. They also argue that as some of the steamship lines form connections with the southern roads in direct competition with them, this competition would be stimulated to their detriment if those lines were permitted to expand on the waterfront. This is not a very serious objection, however, and could easily be outweighed if the other features included in the plan could be made attractive.

D. C. Willoughby has recently come forward with a plan for the terminal development of the west side of Manhattan, which is apparently very similar to the one just outlined. Instead of an elevated road along the river street, Mr. Willoughby proposes to build a four-track subway, connected with terminals and warehouses on the east side of the street, and with the mainland by tunnels under the North river. Under this plan the improvements would be built and operated by a private company, one-quarter of the profits going to the city and the balance to the company.

The Board of Estimate's committee on terminal improvements has drawn up a plan for the elimination of the New York Central's surface tracks and for the expansion of that road's terminals on Manhattan. This plan is now being considered by the Board of Estimate. It provides for the covering of the Central's tracks above Seventy-second street, the construction of exten-

sive yards between Seventy-second street and Sixtieth street and a subway below Sixtieth street connecting with the several terminals of that road. At the hearing on April 8 this plan met with strong opposition on the grounds that the benefits derived by the New York Central would tend to create a monopoly; also that though the city would have more park space along the upper west side, it would be spoiled by being bisected by the structure covering the railroad tracks. It was urged that the problem below Sixtieth street should not be treated until it was decided what should be done for the New Jersey roads so that a plan could be adopted which would benefit all alike. As the covering of the Central's tracks would interfere with the city's plan for extensive parks along the upper west side it was suggested that the tracks in that vicinity should be sunk so that the park space would not be divided.

W. J. Wilgus, a consulting engineer, and formerly chief engineer of the New York Central, has originated a plan, described in the *Railway Age Gazette* of October 16, 1908, page 1150, which involves radical departures from anything hitherto attempted. Under this plan it is proposed to transfer freight in New Jersey from the large freight cars to small standard gage cars of sufficient capacity to carry the largest pieces of package freight, each equipped with an electric motor. These small cars would then be brought to Manhattan, by tunnel or carfloats, where they would connect with tunnels along the marginal way. About 30 joint terminals would be built, some along the east side of the marginal way and others at the chief distributing points in the heart of the city. The interior terminals would be reached by branch tunnels under the sidewalks connected with the main tunnels along the marginal way. These tunnels would be connected with the New York Central and also with the New York, New Haven & Hartford. This plan would overcome the disadvantage of bringing the large cars to Manhattan terminals, where there would be insufficient yard space to handle them properly. The small cars could negotiate sharp turns, and the feature of individual motors would make them easy to handle. The plan would also eliminate long drayage hauls and the wide diffusion of terminals would reduce congestion in the streets.

Cyrus Miller, president of the borough of the Bronx, has devised a plan for the industrial development of the Bronx, which is worthy of mention. That borough has increased rapidly in population, but is sadly lacking in manufacturing industries. President Miller's plan includes an industrial railroad which would skirt the southern and eastern shores of the Bronx, connecting the New York Central with the various branches of the New York, New Haven & Hartford, including the New York Connecting Railroad. This road would connect with a proposed terminal development at the mouth of the Bronx river on the eastern shore of the borough. Warehouses could be built along the line and factories could be reached by spurs. This road should also be publicly owned, so that its advantages could be availed of on equal terms by all. The water at the mouth of the Bronx river is deep enough to enable large vessels to dock, and docks at that point could be reached via the Long Island sound, thus enabling the ships to avoid the difficulties of New York harbor. When the New York Connecting Railroad shall have been completed the Bronx will have excellent connection with all the railroads reaching New York. This section would be highly desirable for manufacturing purposes if these improvements were completed, because land is cheap and there is a very large skilled labor population in the immediate vicinity from which to draw. Adequate railroad and shipping connections would also be available. At present the majority of the working population of that district spends a considerable amount of time and money in transportation to and from places of business, which in many cases are in lower Manhattan. For this reason work in factories almost at their door should prove highly attractive.

SOUTHERN PACIFIC BRIDGE AT SACRAMENTO.

Double Track, Double Deck Structure with Highway on Upper Level—Believed to Be Heaviest Swing Span Ever Built.

The Southern Pacific has recently completed a bridge across the Sacramento river at Sacramento, Cal., which contains what is believed to be the heaviest swing span in existence. Since about 1864, there has been a bridge across the river at Sacramento, and since 1870 it has been used jointly as a highway and railway bridge, the railway and highway using the same floor until 1895. At that time the bridge which has just been abandoned, was built and the grades separated, the railway using the lower floor of the Howe truss spans and the highway a floor placed on the top chords. This bridge was single track and bottled up the entrance to the large yard at Sacramento, the end of the bridge being only about 400 ft. from the depot. This bridge and the earlier ones were of timber construction on pile piers, the piles being driven about 50 ft. into the river bottom, bringing up on the gravel and boulders that form the bed of

54 ft. in diameter, and is 84 ft. high. It contains 5,550 cu. yds. of concrete. The caissons for the other piers were 24 ft. x 60 ft., the piers being 9 ft. 10 in., 10 ft. 7 in. and 11 ft. 1½ in. wide at the top and 37 ft. 10 in. long. The abutments were built back of the slope of the levees on pile foundations, with cut-off below low water.

The location of pier 1 was in water about 2 ft. deep and a small clamshell dredge was employed to throw up an island large enough to support the caisson during construction. The caissons for piers 2 and 4 were built on platforms supported on piles driven around the sites of the piers and were lowered into the water by long screws, the water being 8 ft. deep. There was about 7 ft. of water at the site of the pivot pier, and as the caisson was so large, an island was thrown up to support this caisson also, as it was not considered advisable to lower it into the



Sacramento River Bridge from the Sacramento End.

the stream below the scour line. In considering the renewal of this bridge, it was decided that every effort should be made to build a permanent structure on which the maintenance would be low, so a traffic agreement was made with the counties of Sacramento and Yolo, and work began in June, 1910.

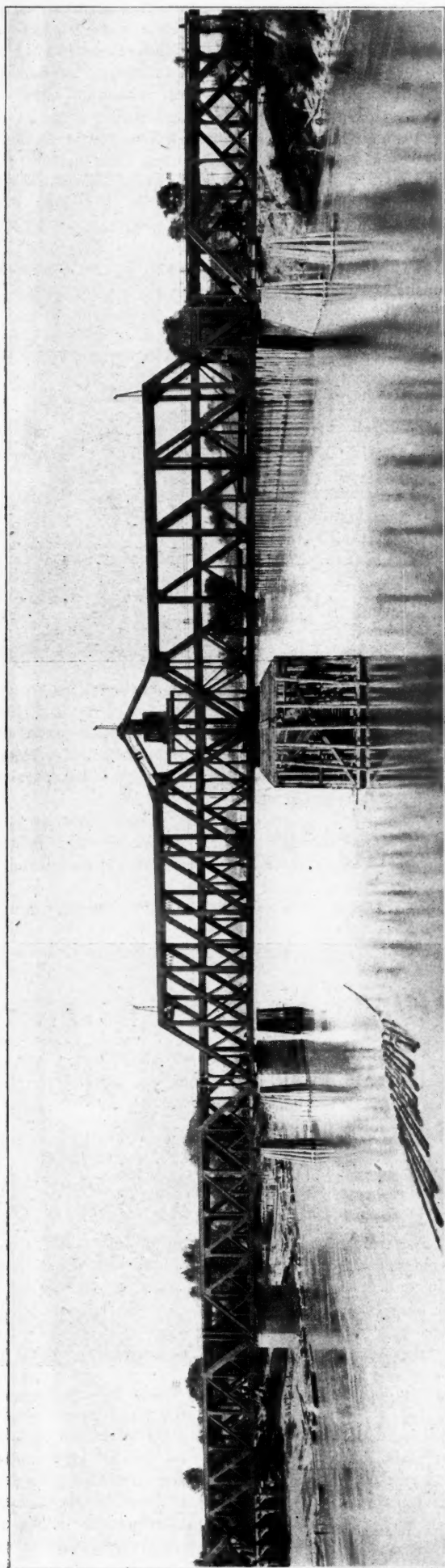
The watershed of the Sacramento is about 27,000 square miles, and the average rainfall is about 30 in., ranging from 18 to 20 in. in the valley to over 100 in. in the mountains. Practically all of the precipitation occurs during a few months in the winter and early spring, so the discharge of the river varies from a minimum of about 5,500 cu. ft. per sec. to a maximum of about 600,000 cu. ft. per sec. The bed of the river is composed of sand to a depth of about 40 ft., under which is a layer of boulders and gravel to a depth of 26 ft., with finer gravel and streaks of clay beneath. Hardpan is found at about 120 ft.

The piers were put in by pneumatic process and were carried down to a 15 ft. penetration into the boulders and gravel. The pivot pier is 42 ft. in diameter, built on an octagon-shaped caisson

water with the screws. No difficulty was experienced in sinking the caissons, and this part of the work was completed in the low water season from June to December.

The superstructure consists of two 167 ft. double track, double deck, riveted spans; one 394 ft. 10 in. double track, double deck, swing span and one 109 ft. 8 in. double track, double deck span with inclined steel highway approaches at each end on 5 per cent. grades. The swing span is entirely center bearing, and weighs a little over 6,300,000 lbs., the steel weighing 4,820,000 lbs.

The lower floor is designed to carry the Harriman Lines common standard loading on two tracks and the upper floor is designed to carry the highway traffic of 100 lbs. per sq. ft., with a concentrated load of a road roller or traction engine weighing 35,000 lbs. on four wheels of 5 ft. gage, with axles 6 ft. apart. The highway is 18 ft. wide, with a 5 ft. sidewalk on each side. The sidewalk curbs are 8 in. high, with the corners protected by 3 in. x 3 in. angles anchored to the curb by curved, swedged anchor bolts.



Sacramento River Bridge of the Southern Pacific.

The floor slab and sidewalks are reinforced with triangular mesh wire reinforcement, and the stringers and floorbeams on all parts of the bridge directly over the railway tracks are encased in concrete, except on their bottom flanges. The wearing surface on the inclined approaches is composed of creosoted blocks cut from close-grained red fir and treated by the full cell process.

The concrete slab was finished to a true surface $\frac{1}{2}$ in. low. When set, a layer of dry sand and cement in equal proportions was spread over the slab and struck off with a straight-edge to the proper height to receive the blocks which were then laid on an angle of $67\frac{1}{2}$ deg. with the curb and brought to surface by tamping on a 2 in. plank about 8 ft. long. The surface was then flooded with water and kept wet for several days. An expansion joint 1 in. wide was left at each curb and all joints were filled with hot refined asphaltum. The wearing surface on the level part of the bridge is a 2 in. layer of asphalt bitumen.

The center bearing is a phosphor-bronze disc, 52 in. in diameter and 6 in. thick, placed between the two nickel-steel bearing plates $5\frac{1}{2}$ in. thick. The lower center is of cast steel 9 ft. in diameter and 2 ft. $2\frac{3}{4}$ in. high, and the upper center is 5 ft. 9 in. in diameter and 1 ft. 8 in. high. The lower center casting rests on a grillage 12 ft. 6 in. square and 4 ft. 4 in. high, built into the pier, the top of the grillage being 3 ft. 8 in. below the top of the pier. This was necessary on account of the limited distance from the top of the pier to the base of rail, which was only 8 ft. $4\frac{3}{4}$ in. The grillage is built of 24 in. 120 lb. I-beams with 1 in. plates on the top and bottom, one set of I-beams being at right angles to the other, with the spaces between the beams filled with grout.

The top center casting supports three cross girders, which carry the span. These cross girders are 5 ft. 10 in. deep back to back of angles, 38 ft. 2 in. long, with webs $8\frac{3}{8}$ in. thick, composed of five 1 in., two $1\frac{1}{8}$ in. and two $\frac{5}{8}$ in. plates stitch riveted together with $1\frac{1}{8}$ in. rivets. There are five coverplates $15/16$ in. x 27 in. The cross girders are spaced 2 ft. 4 in. center to center and weigh about 105,000 lbs. each. The lower chords butt against these cross girders, diaphragms between them making a continuation of the chord.

The center post rests on top of the cross girders and the inner end posts connect to gusset plates at the foot of the center post. The upper chord bars are $2\frac{1}{8}$ in. x 16 in., with a 16 in. pin, there being six bars in each set.

The span was erected with a regular straddle-leg traveler on the permanent draw-rest or protection.

The calculated dead load swing deflection at the ends was $5\frac{1}{8}$ in., and as the end wedge uplift is $15/16$ in., the eyebars were shortened to take up $4\frac{3}{16}$ in. The span was connected up and riveted with the ends $4\frac{7}{16}$ in. high, and when swung with the entire dead load, it deflected to $4\frac{7}{8}$ in., or $\frac{1}{4}$ in. less than the calculated amount.

The ends of the span are raised and locked by a wedge at each corner having a taper of 1 in. in 5 in., the stroke being about 20 in. The center of the span is steadied, but not lifted, by a wedge on each side under the ends of the cross girders having a taper of 1 in. in 10 in., with a stroke of 12 in., and the track rails are raised 8 in., at their ends, by the same machinery.

An automatic latch at each end of the span assists in centering the bridge. These latches are withdrawn by power, when the wedges are drawn and the rails lifted, but are disconnected from the other machinery as soon as the span swings a foot or so, and are then ready to drop automatically when the bridge is closed again. The latches are counterbalanced and adjusted so they will not drop, if the span is moving too fast when closing.

The span will open in either direction and the ends are reversible. The span balances very closely, this balance being maintained by 12 balance wheels which travel on a circular track just inside of the rack. Four wheels in equalizing carriages on each side of the span and two fixed wheels under the first floor-beam on each side of the center keep the ends of the span from

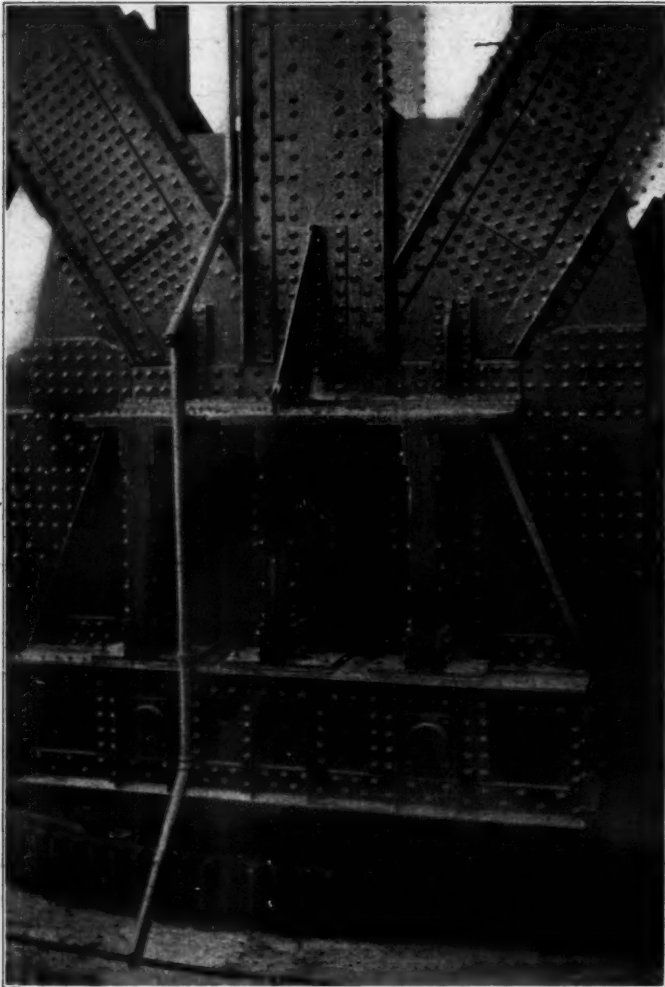
tilting too much. A clearance of $\frac{1}{8}$ in. is allowed under each wheel, so they carry no weight except the slight amount required to overcome any lack of balance due to wind, etc.

The machinery is operated and the span lighted with 550 volt direct current, which is taken to the top of the pivot pier through a submarine cable, which also contains two wires for a telephone. The terminals are connected to two circular rings made of 50 lb. steel rail which are supported on concrete blocks on the pier, the insulation being a treated wood block 6 in. thick. Street railway contact shoes are fastened to the bridge and slide on the power rails.

The electric current is purchased from the Pacific Gas & Electric Company who have several sources of power, all of which are not likely to be interrupted at the same time. A storage battery of 160 cells has been provided for use in case of power trouble,

They are held in release after the current is shut off the motor so the bridge can drift as much as is desired.

The controller is of the series parallel type and has the necessary resistance for controlling the operation of both swinging motors. Switches in the base will cut out either motor. The three wedge motors are operated by controllers geared together so as to be operated by one handle. The operator's house is



Details of Center Showing Heavy Cross Girders.

of sufficient voltage and capacity to swing the bridge four or five times at slow speed.

The swinging motors are two series wound, weather-proof motors of 75 h. p., mounted on the lower chords, one on each side of the bridge near the center. Each motor is geared through a separate train of gears to two rack pinions, which mesh in a rack with a pitch diameter of 38 ft. $2\frac{3}{8}$ in. The motors and gearing develop a rack pressure of about 300,000 lbs. The center wedges are operated by a 10 h. p. motor and the end wedges by 40 h. p. motors, one at each end of the bridge. All motors have solenoid brakes capable of holding against the full power of the motor. The brakes on the motors operating the wedges are released when the current is applied to the motor and are automatically applied when the current is shut off. The brakes on the swing motors are shunt brakes and are released on the first point of controller, without applying power to the motor.



Upper or Highway Deck.

situated directly over the highway deck at the center of the bridge and from it all movements are controlled. Overload circuit breakers and the necessary fuses are provided, as also are a voltmeter and an ammeter.

An air compressor of 16 cu. ft. per minute capacity supplies air for the signal system and for the whistle which is used to signal boats. This compressor is electrically operated and automatically controlled.

The highway gates are operated by 2 h. p. motors connected



Lower Railway Deck.

with worm gearing to the gate posts. Double-throw switches in the operator's house open and close the gates. These gates are about 14 ft. long. When open they form part of the handrail of the adjacent fixed spans, and when closed swing across the sidewalk and highway away from the swing span. This allows them to be opened toward the swing span and away from any

teams or pedestrians that may stand close to the gates, waiting for them to open.

Electro-pneumatic signals and derails are provided for both tracks at each end of the bridge, the wires being coupled and uncoupled by a connection on the shaft which raises and lowers the rails. The ends of the fixed and lift rails are locked to each other by wedges, one on each side of the fixed rail, which slide on a base-plate with beveled guides. The travel of the wedges is $6\frac{1}{2}$ in., and they are operated by air cylinders electrically controlled. When the wedges are pulled back the lift rails are free, and when pushed forward they engage about 6 in. of the end of the lift rails, making a positive lock. The beveled guides clamp the wedges tightly to the rails. The outer wedge is a little higher than the track rail for a few inches at its center, forming an easer rail to carry the wheels over the gap between the fixed and lift rails.

The bridge is unlocked in about 20 seconds and swung 90 deg. in about $1\frac{1}{2}$ minutes, the entire operation seldom taking more than five minutes. It is opened on an average of about 12 times per day.

The highway deck is lighted by 225 incandescent lamps of 16 c. p. placed in 3-light clusters on lamp posts about 40 ft. apart along each handrail. These lamps are wired in circuits so one, two or three may be lighted at a time.

The American Bridge Company furnished the steel superstructure, the total weight of which is 4,500 tons. The pneumatic foundation work was put in by the Missouri Valley Bridge & Iron Company, the other foundation work, erection, installation of machinery, etc., being done by the Southern Pacific forces.

The structure was designed under the direction of John D. Isaacs, consulting engineer for the Southern Pacific. The foundation, concrete floors, electrical and signal systems, etc., were designed by and the work in the field was performed under the direction of J. Q. Barlow, assistant chief engineer, G. W. Rear, general bridge inspector, being directly in charge.

GOVERNOR CRUCE'S MESSAGE VETOING OKLAHOMA TRAIN CREW BILL.

The legislature of Oklahoma recently passed a full crew bill which Governor Cruce vetoed. The governor's veto message was as follows:

"I have studied this bill from every angle and the more I have studied it, the more I have become convinced that it should not receive my approval. In the enactment of this bill, it is only the railway companies and their employees that have been considered. The thousands of people in this state who travel upon the railroads and ship their products and merchandise over same have not entered into the discussion. This fact, however, must remain after all has been said, for that every dollar of expense placed upon railway corporations in Oklahoma will ultimately be paid by those who patronize the railroads. The cost of putting this bill into operation is estimated by the corporation commission at something like \$250,000, while the cost is estimated by the railroad companies at more than \$400,000. But whether it be \$100,000 or \$500,000, that amount in the end will be paid by those who use the railroads. Another thing I have learned to believe is that those who have made a lifetime study of railroad operations are better judges of the proper method of operating them than I am, and I believe that this is equally true when applied to a majority of the members of any legislative body. The trouble in Oklahoma is and has ever been that in dealing with public service corporations we have assumed to know more about how properly to operate them than those who have given the matter careful study. Public service corporations need to be regulated and need to be controlled. Oklahoma has undertaken to do this by the creation of a corporation commission and has clothed that commission with unusual authority in dealing with such matters. That commission, after having studied this question, is better

able to place suitable regulations upon the railroads than is the governor or the legislature.

"The practical effect of this bill would be to give employment to a number of railroad men without increasing the efficiency of the service, and would be supplying positions for three men to do the work that can be done by two. It is in entire harmony with the principle that has prevailed in this state of creating an army of officials to do the work that ought to be done by half that number of men. This legislature has set itself to the task of reducing the number of officials drawing salaries from the state, and a Herculean task it is proving. It is certainly inconsistent while trying to curtail the number of useless public officials, to increase the number of appointed employees, who in the end must draw their subsistence from the same source that is now drawn upon by these useless public employees."

THE OTIS INCLINED FREIGHT ELEVATOR.

The three inclined elevators for moving truckloads of freight up an inclined gang plank (from a steamer) which were installed at the Union wharf of the Metropolitan Steamship Company at Boston about three years ago, have not only been the means of a large saving in the cost of handling the cargoes of the vessels using that wharf, but, according to Albert Smith, general agent of the company, there has been a saving of 20 per cent. in the time required to unload the ships. From 1,000 to 1,500 tons of freight is unloaded over the inclines daily, a quantity which previously required the labor of 150 men, which number has been materially reduced. The cost for electric power per month is \$30. The machines are only used



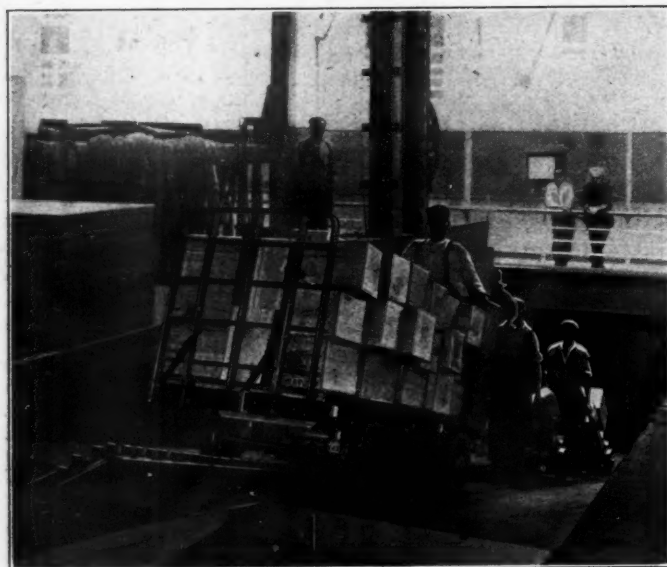
Inclined Elevator at Mystic Dock, Boston & Maine Railroad, Boston.

during the periods when the inclines, owing to the position of the ship, are decidedly up-hill, and not when the gangway is level. Mr. Smith estimates that when in operation the three machines carry 125 tons of freight an hour, during a period of five hours each day. The current, at 20 cents an hour, makes the cost of power 1 cent for every six tons of freight moved.

The inclined elevator is simple in construction and operation, and the photographic view illustrates its operation clearly. It may be installed on any shipping platform or gangway, or in any warehouse or freight station to connect one floor with another. The machine consists essentially of an endless chain, of special construction, kept in motion by an electric motor. It is provided on its lower side with malleable iron shoes, which slide in a lubricated steel channel, supported on a wooden

bolster bolted to the incline. The upper surface of the chain is provided with projecting teeth or lugs. These lugs engage the axle of the truck as it is drawn on the incline, and the truck and its load are hauled or, rather, pushed, up by the endless chain. The truck wheels roll on the floor of the incline and, of course, support and carry the load. At the upper end of the incline the chain turns about the driving sprocket and the lugs are disengaged from the axle of the truck, the wheels of the truck at this time being on the horizontal floor. The machine works successfully with either two-wheel or four-wheel trucks. With a two-wheel truck the man goes with the truck, and in practice, he leans back upon the truck handles and is, in effect, pushed up the incline with his load. With four-wheel trucks, it is not necessary to have a man accompany the truck, and with these, capable of carrying much heavier loads, certain installations make use of electric trucks carrying loads of 4,000 lbs. and over.

The motor operating the machine is located on the upper floor at the side of the incline. The main shaft, carrying the driving sprocket which operates the hauling chain, is provided at its outer end with a steel spur gear, journaled so that the gear projects a considerable distance above the floor line. Meshing



Inclined Elevator at the Dock of the Merchants & Miners' Steamship Company, Savannah.

with this gear is a steel pinion mounted on a countershaft, which is journaled on a special bed plate supporting the motor. This countershaft carries a spur gear which meshes with a pinion mounted on the motor shaft. The motor is wound, when so desired, to produce two speeds, one of which gives a speed of travel in the hauling chain of 125 ft. per minute, and the other a speed of 250 ft. per minute. The motor is also provided with a suitable friction brake. When desired, a reversing switch is provided which enables the inclined elevator to be run backwards, for the purpose of carrying loads down the incline. All these operations are under perfect control of the attendant.

The consumption of electric current is relatively small, the friction in the machine being reduced to a minimum. When the elevator is running without its load, the power required to keep it in motion is approximately 2 h. p. When carrying, say, five loaded trucks, which amount in the aggregate to 2,500 lbs., up an incline 50 ft. long, at an angle of 25 deg., the trucks moving at a speed of 250 ft. per minute, the machine is carrying 12,500 lbs. of freight a minute, or 375 tons an hour. To do this, requires a consumption of electric power of about 10 h. p. Assuming a cost of 5 cents per h. p. per hour, for the electric current, the total cost to elevate 375 tons is 50 cents. These figures are the result of tests made under actual working con-

ditions. Where it is necessary to meet a variation in the height of vessels due to the rise and fall of the tide, the "inclined drop" is furnished with hinges so that it may be raised or lowered.

The platform type of elevator is a moving incline formed of hard maple treads to which are fastened small leather covered cleats. At the right and the left, that is, at each end of the treads, are projecting lugs which engage steel projections bolted to the bottom of the trucks. With this type, if trucks are not used, packages of merchandise can be laid on the moving platform and carried up or down.

The capacity of a machine of any type varies, of course, according to the speed at which it is driven, the type of truck employed, and the speed at which the truckmen move their trucks. Ordinary hand trucks can be carried about 10 ft. apart. At a speed of 250 ft. per minute, the machine is capable of transporting 1,500 hand trucks an hour. Fully 25 per cent. of the number of truckmen required under old-fashioned methods, can be dispensed with; and the remaining stevedores can individually perform the work of several men working under oldtime methods.

Because of the rapid movement of the inclined elevator and the ease in ascending the incline, the truckman ascends at a trot. With the platform type the attendant rides up with the load if he so desires. When the top is reached he must not slacken, because of the line of trucks behind him. This has a tendency to speed up all the workers and keep them moving at a dog trot, on the levels as well as on the incline. In some instances where the rise and ebb of the tide is very pronounced, the dock elevator has performed its work at a grade of approximately 45 per cent.

Sets of these machines have been installed at the Pequonnock dock, Bridgeport, Conn., owned by the New York, New Haven & Hartford; at Mystic wharf, Boston, of the Boston & Maine; at the Savannah docks of the Merchants & Miners Transportation Company; the dock of the Old Dominion Line, New York, and at other places. The photographic view is typical of all these installations. This inclined elevator is manufactured by the Otis Elevator Company, of New York.

SOUTH MANCHURIA RAILWAY ESTIMATES.—The estimates for the next fiscal year for the South Manchuria Railway have been curtailed by about \$1,000,000, some of the new enterprises having been abandoned and some of the new works originally planned to come in the present fiscal year having been put off to the coming year. This leaves approximately \$7,000,000 as the estimates for the ensuing fiscal year which will be invested principally in the following undertakings: Improvement of the main line and the Mukden-Antung line; construction of passenger and freight cars; prosecution of Dairen harbor works; widening of entrance to the Kawasaki dock; establishment of an agricultural experiment station at Kungchuling; construction of transfer arrangements between steamer and wharf at Antung; construction of new warehouses at Newchwang, etc.

NEW LINE FOR SPAIN.—The Spanish government has approved a project, now well under way, for constructing a 35-mile railway from Huelva to Ayamonte, in the Seville district. As Ayamonte is a frontier town, whence ferries cross the river to Portuguese territory, the projected railway will facilitate access to Portugal and is hoped to shorten to some 18 hours the journey from Seville to Lisbon, via Huelva. It is also supposed that most of the traffic between Portugal and Andalusia will pass over the new line, in addition to many of the tourists who land or embark at Lisbon. The new railway, the complete construction of which is expected to take not more than 20 months, will have nine stations, including the termini. Its estimated cost of construction is about \$770,760. The line will run over low, level, marshy land. The road is to be of the 3 ft. 3 in. gage. The projectors of this railway are the Sociedad Espanola de Ferrocarriles Secundarios, with offices in Madrid.

General News.

President B. L. Winchell, of the Frisco lines, traveled 55,394 miles in 1912, and 59,173 miles in 1911. During 1912 he attended seventy-five meetings, which included banquets and conferences.

A bill has been introduced in the Illinois legislature providing that the maximum fare to be charged by any railway for continuous trips within the limits of a municipality shall be five cents.

The conference committee of the railroads, representing the 54 eastern lines, has agreed to confer about wages with committees of conductors and trainmen in New York City on April 22. The conductors and trainmen presented their demands about three months ago. The increases which they want are said to average 15 per cent.

The lower house of the Pennsylvania legislature has passed a bill providing for the establishment of a commission of three citizens to fix the minimum wages to be paid to all women and children who work in industrial establishments in the state; and there are provisions relating to railroad employees, one of which is that every flagman must have had 18 months' experience on trains.

The workmen's compensation bills which were considered by the legislature of Oklahoma at its recent session were all rejected. Faults pointed out by the governor, in the compensation law which is in force in the state of Washington, appear to have made the legislators cautious. The legislature of Indiana also has adjourned without passing any compensation law; and in Missouri the subject has been postponed until the next session of the legislature.

In connection with the reorganization of the operating and maintenance staff of the Dominion government railways, a change has been also made in the system of accounting on the Intercolonial. The system in use on the Canadian Pacific has been adopted, and the accounting will be done by divisions. An accounting staff is being organized at each of the four superintendents' offices, and these offices will report to Moncton, where the accounts for the system will be assembled.

It is announced this week that strikes of track laborers on the Pennsylvania Railroad have been broken, some of the strikers returning to work, and a large number of new men having been employed. Small local strikes in the track department have been reported at Trenton, Philadelphia, Altoona and other places on the main line. The principal trouble appears to have been the influence exerted over the laborers by leaders in strikes at industries near the railroad, which were managed by the "Industrial Workers of the World."

The legislature of Arkansas, which adopted a full crew law some years ago, has this year taken further action for the benefit and protection of the brakemen. At least the brakemen's monthly magazine says that the law is for their "benefit and protection." By an act which goes into effect on May 1, there must be three brakemen in each switching crew at all places where cars are switched, pushed or transferred across public crossings within a city; but the law applies in cities of the first and second classes only, and does not apply to roads less than 100 miles long. The full crew law applying to freight trains has a clause exempting railroads less than fifty miles long, and the penalty, \$100 to \$500 for each train unlawfully run, does not apply during strikes of men in train service. The full crew law of Arkansas as it applies to passenger trains requires in each crew, a porter and a flagman or a brakeman; but it does not apply to trains of less than three cars.

A "safety-first" rally of employees of the Ann Arbor Railroad was held at Owosso, Mich., last Saturday evening, April 5. The principal speaker was R. C. Richards, general claim agent of the Chicago & North Western, the originator of the safety-first movement. Following the lecture the railroad company gave a dance for the employees and their wives and sweethearts. There were between 900 and 1,000 people at the meeting, of whom at least half were actual employees. Mr. Richards spoke for two hours. He had with him a large number of stereopticon

views, vividly illustrating his arguments. Several general officers from Toledo and all of the local officers were present. The train and enginemen, track and shopmen, and station forces of the road have taken a keen interest in the Safety First movement, and an organization of the employees, patterned after the one on the Chicago & Northwestern, was begun about a month ago.

The state of Arkansas is now the most progressive in the union, at least in one respect. The promoters of the anti-tipping propaganda have actually got the legislature to "come across" with a law, and the law is now in effect—except where the customer and the servant conspire to evade it. The act is No. 98, and it makes it a crime to solicit or receive any "gift, compensation, honorarium, or gratuity, commonly known as a tip." A railway or sleeping car company which permits tipping will be guilty of a misdemeanor. It is reported that some dining-car waiters and sleeping-car porters have asked their bosses to transfer them to runs outside of Arkansas. We have no confirmation of this report, though these men have done some audible growling. In other places, however, there is a marked absence of complaint, and it looks as though a large part of those travelers who have been in the habit of giving tips may be waiting for the state to begin some prosecutions before changing their practice.

New York Terminus of the Lehigh Valley.

Beginning May 1 the Lehigh Valley will run its passenger trains to and from Jersey City over the tracks of the Central Railroad of New Jersey, and will use the terminal station of that company, the contract for the use of the Pennsylvania terminal expiring at the end of April. Ferries from the Central of New Jersey station run to Twenty-third street and to Liberty street, New York City. The Lehigh Valley will use its own tracks to a point within about two miles of the Jersey City terminus. Passengers to and from Newark will use the new station of the road in that city, at Elizabeth and Meeker avenues. This station is conveniently reached by street-car lines from Broad and Market streets.

"Make the Railroads Aid Ohio."

The head-line artist has a multitude of sins to answer for. The heading of this paragraph, sent to us by a correspondent, who cut it from the *Kansas City Times*, is an example. Often the head-line editor seeks novelty with such exclusive enthusiasm that he forgets both the facts and the perspective. We hardly expect to reform him; but we sympathize with our correspondent, who says:

This would seem to indicate that the railroads had refused to assist the people of the stricken communities and were withholding offers of aid until compelled to act by state authorities; or that the railways had been temporarily appropriated by the state on account of their (the railways') refusal to lend assistance. The railways are by far the heaviest individual losers in many such disasters; but they are in most instances the first to offer such assistance as is within their power to grant; free transportation for supplies, physicians, etc., and usually substantial monetary contributions. If the people had even a vague idea of the aid extended annually by the railways to charitable causes, they would be amazed. Think of the prompt action of the railways in tendering services and money at the time of the San Francisco fire and of the very recent Omaha tornado.

A Directory of Commercial Organizations.

In response to a senate resolution passed December last, the Department of Commerce has submitted to the senate a list of the commercial organizations in the United States. This record, with a list of agricultural organizations, will be printed for distribution, provision being made for 1,500 copies for the use of the senate. The list of commercial organizations was prepared by the Bureau of Foreign and Domestic Commerce, which for nearly two years has been collecting for use in its own work detailed information regarding such organizations, their functions, membership, income, etc. The information in the files of the bureau at the time the resolution was adopted was supplemented by such additional facts as it was possible to obtain before Feb-

ruary 15, the date on which the list was to be submitted to the senate, and this list when published will record about 3,500 national, interstate, state, and local organizations.

In the compilation of its information the bureau has utilized various symbols to indicate the field of service and the activities of the various organizations. These symbols have been used in the list submitted to the senate, so that when published it will furnish in a concise manner a complete record of the organizations, their functions, membership, and other details. The information thus compiled constitutes a directory of commercial organizations of the country such as has never before been prepared and it should prove of practical value to business men.

New Railways by Fiat.

The Texas Welfare Commission says that the hour has come when in the name and behalf of Texas and for her prosperity and further progress radical changes for the better must be brought about in the railroad situation. "New lines must be constructed; old lines must be improved; additional yards, terminals, sidings and depots must be constructed. Safety signal devices should be installed; second track should be built; grades should be revised; wooden bridges should be superseded by steel and masonry; heavier rails should be laid." But where is the money to come from? Texas has led the procession in the matter of regulating the railways. Let us now see what success it is going to meet with in securing capital for the railway extensions which "must be built."—*Railway Record*.

The New York Dock Railway.

Subject to the approval of a contract yet to be made, the New York State Public Service Commission for the First district has authorized the New York Dock Railway to issue \$500,000 in capital stock, \$450,000 preferred, and \$50,000 common. The New York Dock Railway was organized by New York Dock Company interests for the purpose of operating a short railroad, which crosses certain streets in Brooklyn, and therefore had to have a franchise from the city. The proceeds of the sale of the new stock will be devoted to the following purposes:

Property to be acquired from the New York Dock Company	\$383,100
New barges and lighters	33,300
New railroad construction	22,000
Corporate stock deposited with the city	5,031
Payment to the city for local franchise	5,000
Organization expenses	3,918
Legal expenses	26,905
Working capital	20,746
Total	\$500,000

A contract for the transfer of the tracks and property to the New York Dock Railway is at present the subject of public hearings.

New Railroad Laws in Texas.

The legislature of Texas at its recent session passed the following bills affecting railroads:

An act making it a misdemeanor for station agents to fail to bulletin properly the arrival and departure time of passenger trains.

An act authorizing the Missouri, Kansas & Texas to take over and operate several of its subsidiary lines.

An act authorizing the Houston & Texas Central to purchase and operate the Hearne & Brazos Valley.

An act authorizing the Texas & New Orleans to take over and operate the Burr's Ferry, Brownell & Chester.

An act authorizing the St. Louis Southwestern to take over the Stevensville North & South Texas.

An act authorizing the Gulf, Colorado & Santa Fe to take over and operate its Pecos Valley lines.

An act authorizing the El Paso Southwestern to take over and operate the El Paso & Northeastern.

An act requiring railroads to equip all side tracks with derauling devices.

An act providing that no railroad shall build lines within 4,000 feet of the shore line of Aransas Harbor.

An act extending the time for two years in which railroads may complete extensions of their lines, as provided in their respective charters.

A resolution directing the attorney general to investigate the

St. Louis Southwestern Railroad's alleged violation of its charter provisions in not building an extension of its Eastern Texas line from Lufkin to Crockett.

Report on Collision at Ford's, La.

The railroad commissioners of Louisiana, reporting on a butting collision, which occurred on the Vicksburg, Shreveport & Pacific near Ford's, February 21, where west bound passenger train No. 5 encroached on the time of east bound passenger train No. 2, say that too much discretion is allowed to employees in the operation of trains. Trains should be operated under positive orders. In other words, "the block system is deemed by the commission to be the safest system of operating trains." It is true, say the commissioners, that the superintendent, in his testimony, intimated that the failure of the employees to obey the rules in this case had shaken his confidence, so that he feared they would not obey the signals of a block system. But, says the report, "this does not appeal to the commission as being logical. There seems to be no dispute on the general proposition that it is safer to operate trains by keeping them a specific distance apart, rather than a specific time apart."

The Grand Trunk in Southern New England.

President E. J. Chamberlin, of the Grand Trunk, last week sent a letter to the governor of Rhode Island offering to give to the state the Southern New England Railroad, the unfinished line between Palmer, Mass., and Providence, R. I., begun by the Grand Trunk, as it now stands; on condition that the state complete the road and agree to one of two ways of operating it. The alternative methods of operation proposed are described as follows:

"First—If the state desires to operate the railroad, we will grant running rights on reasonable terms over the New London Northern from Palmer to Brattleboro, Vt., so as to make the line sufficiently long to constitute an operating division; and we will also make a traffic agreement between the Central Vermont and the state-owned railroad for a division of through rates on a mileage basis with a reasonable additional allowance for terminal charges; or, second,

"The Central Vermont will lease the state-owned railroad for a rental equivalent to 5 per cent. interest on the actual cost to the state of completing the whole line."

The statement adds that the line cannot be completed by the company unless the state becomes the second guarantor of the necessary bonds (as heretofore proposed by Mr. Chamberlin); and that if the state is unwilling to accept the road as a gift and complete it, the contractors will remove their apparatus, and the line will be definitely abandoned about the middle of the present month.

Mr. Chamberlin says that the sum of two and a half million dollars has already been expended on the line and that its completion will require several millions more than was originally estimated.

The services of the Grand Trunk engineers are tendered to the state, which would receive also all plans, surveys and other data used by the company. If the state does not wish to accept the offer, it is asked to consider the earlier request to guarantee the company's bonds.

The Flood Damage.

Accurate accounts of the damage done by the floods of March 25-29, in Ohio, Indiana and adjacent states are still lacking, the work of restoration being the greatest emergency-burden ever experienced by the principal roads in central territory. President Willard of the Baltimore & Ohio has estimated that that company's losses will amount to 2½ to 3 millions of dollars, and the loss of traffic for the last week of March and the first week of April will aggregate two millions. The property loss of all railroads in the territory damaged by the floods of the 25th-27th he estimated at from \$18,000,000 to \$20,000,000. He said that it would be impossible for the company to make many of the improvements which had been planned. At Zanesville the B. & O. lost a car shop worth about \$300,000 and a bridge worth \$250,000. The road lost 12 bridges in the flood and had several miles of track completely washed away. Trains were run through from Washington to Chicago, April 4, over its own lines, although it was necessary to detour trains over divisions not or-

dinarily used for this traffic. At Zanesville and on the Ohio River division it took many days to make even temporary repairs. At Hamilton and Dayton the railroad yards were ruined.

The Chesapeake & Ohio was able to run trains east of Huntington, W. Va., by the 4th, but west of there it took until the 6th to restore the tracks to Cincinnati. West of Cincinnati the damage was extensive and the line was not opened till the 9th.

The Pennsylvania lines in Ohio suffered severely. An officer said that the steel bridges lost would aggregate in length about 8,000 ft. A second rain in central Ohio on the 4th caused some washouts, and the Pennsylvania, after using its own line for a short time was obliged again to use the Erie between Akron to Mansfield. A second series of washouts occurred also on the Cleveland, Akron & Columbus. The Pennsylvania's bridges, which were wrecked beyond repair, numbered 14, six of which were large ones. The Cleveland & Pittsburgh was opened through on April 2.

The Toledo, St. Louis & Western was opened throughout its length April 1.

The Wabash seems to have suffered less than the other roads in Indiana, and freight was accepted April 2.

The Largest Ship in the World.

The new steamship "Vaterland" of the Hamburg American Steamship Company was launched at Hamburg April 3, the greatest mass of steel ever put into the water. The vessel's launching weight was 31,000 tons, and her gross tonnage will be over 50,000 tons. She will be 950 ft. long, and 100 ft. wide; and her height, from keel to masthead, will be 250 ft.

This vessel will be 5,000 tons larger than the "Imperator," her sister ship, which has lately been finished, and which will cross the Atlantic next month. The "Vaterland" will not be ready for service until 1914.

All of the three new monster ships of the Hamburg American line will have double steel hulls, the inner "skin" being carried high above the water line. In the "Vaterland" 1,500,000 rivets were used, weighing 1,500 tons. The steel plates were riveted together, and the walls completed, before the port holes were cut. These holes were made by the use of the acetylene torch. These vessels will have search-lights of 80,000 candle power, and the lights will be placed high enough to throw their rays thirty miles out to sea. The "Vaterland" will have 84 life boats, two of which will be equipped with high power motors, capable of towing other boats. These motor boats will have wireless telegraph apparatus, with which messages can be sent 200 miles.

Pere Marquette Investigation.

Newman Erb, chairman of the board of the Pere Marquette, testified before the legislative committee which is investigating the affairs of the road, at Lansing, Mich., on March 28. Among the reasons for the deficit which threw the road into bankruptcy, he mentioned wage increases, bad weather, and disruption of traffic caused by undertaking too many improvements at one time. President Cotter tried to do too much at once in 1911, he said, tearing up too many lines at once and interfering with traffic. He also criticised the men who managed the road during the eight years between his first connection with it, and his second connection as receiver, saying that they "sat like bumps on a log" and made no effort to develop the property. He considered the road to be worth \$70,000,000, the amount of its present funded debt, as a future prospect, and expressed the belief that it was not necessary for the stockholders to lose a single cent. With \$20,000,000 the road could be made a paying institution in two years under present conditions, and with half that sum in four years. He also cited the gradual reduction in rates from an average of 7.03 mills per ton mile in 1902, to 5.75 mills in 1911, while expenses have been going up at the rate of \$1,000,000 a year for wages, \$500,000 for materials, and on an average of \$280,000 for taxes. If the 1902 conditions had prevailed in 1911, he said, the net earnings would have been increased by \$6,000,000. Some of the branch lines are unproductive, and will be for years. The road must be put in condition to handle cheaply long-haul tonnage. If the state imposes no further burdens the Pere Marquette will emerge from its difficulties.

Eugene Zimmerman testified before the commission on April 2. He declared that the Cooley appraisal of \$28,000,000 as a re-

placement value of the road was entirely too low, as was the second appraisal of \$34,000,000, and he thought it was worth nearer \$70,000,000, but would make no definite estimate without a thorough investigation. He said that Michigan, through its laws affecting railroads, was confiscating them, and that he would not invest a dollar in a Michigan road. Asked if he did not think the people would be willing to give the roads higher rates if the roads demonstrated the necessity, he replied, "No, I don't; lots of the people are not honest." He did not think the state could operate the road successfully, because there would be too much politics in the management and that it would ruin the state. In his opinion the road could be operated at 75 per cent. of its gross earnings, and the latter could be increased from \$17,000,000 to \$20,000,000. Mr. Zimmerman also, under cross-examination, furnished the committee with a large amount of detailed information regarding the financial affairs of the road and the various sales of its stock.

Pennsylvania Pensions.

The Pennsylvania Railroad has now paid pensions 13 years, and a total of 7,152 men have received payments, through the funds, of \$8,368,786, all out of the earnings of the various companies in the System. Of this amount \$6,319,902 has been paid on the lines east of Pittsburgh, and \$2,048,884 west of Pittsburgh. At the present time there are 3,807 men on the pension rolls. On December 31 last, there were 296 pensioners on the lines east of Pittsburgh more than 90 years of age. The names, occupations, and divisions where last employed of those over ninety years of age were as follows:

Name.	Occupation.	Division.
Micheal Eckerline....	Laborer	Altoona shops.
James Kaylor	Blacksmith	Altoona shops.
Elias Griffith	Watchman	Altoona shops.
James L. Shields....	Foreman mason	Conemaugh.
David L. Graeff.....	Machinist	Philadelphia.
Thomas C. Payne....	Laborer	Trenton.
Charles Lupton	Car. builder	Philadelphia Terminal.
James Gray	Agent	Elmira.
Chas. A. Jefferies, Sr.	Signal repairman....	Philadelphia.

The pension amounts to one per cent. of the average salary or wage for the ten years previous to retirement, multiplied by the number of years the man has been in the employ of the company. Employees retire without any obligation whatever to the Pennsylvania Railroad, and many of them engage in outside occupations. This pension plan, inaugurated by Mr. Cassatt in 1899 with much doubt as to its eventual success, is now declared by the officers of the company to have proved to be of immense benefit to a large number of men, and to have contributed enormously to the contentment of the men in the service of the road.

Suit for Southern Pacific Lands.

Julius Kruttschnitt, chairman of the executive committee of the board of directors of the Southern Pacific, testifying at New York City this week in the suit of the government charging fraud in the acquisition of lands by the Southern Pacific in Kern county, Cal., denied the truth of the statement, published last year, on the authority of the attorney general, that officers of the Southern Pacific had known that lands on which the companies sought patent, contained oil. The land in question aggregates 6,800 acres and it has been charged that it is worth \$15,000,000. Mr. Kruttschnitt denied emphatically that there had been any fraud or deception in obtaining the patents.

Asked if he considered \$15,000,000 a fair value of the lands now he said:

"I don't consider the lands of any value. Were it not for the imputation of fraud in this suit I would favor selling the lands for 15 cents an acre to any person who might be foolish enough to buy the property."

He contended that the lands in 1904 were poor grazing or agricultural lands, as stated in the patent claim.

He admitted that some time previous to the patent of these lands he had been in charge of the oil development work of the Southern Pacific, but he declared he had no information as to the land other than that contained in the official papers and map used in the patent proceedings. He denied the claim made by the government that the Southern Pacific had a thorough examination of the land made before the patent was secured. He said the Kern Trading & Oil Company was a fuel oil development and oil purchasing department of the Southern Pa-

cific. There was no secrecy in connection with its formation. "We did not consider it oil land in 1903-4," he said, "but some years later 'wildcat' promoters entered this territory, and through their operations the impression was created that the land was generally oil producing. Those fellows had to give up in despair and abandon the fields."

W. N. Mills, special assistant attorney-general, turned to Mr. Kruttschnitt and said:

"Don't you know that there are three valuable gushers now in operation on these lands, producing 1,000 barrels of oil daily?"

"That is news to me," replied Mr. Kruttschnitt. "I am glad to hear it, for if that is so the land has some value."

Railway Club of Pittsburgh.

At the next meeting of the Railway Club of Pittsburgh, to be held April 25, Walter V. Turner, chief engineer, and P. H. Donovan, mechanical engineer of the Westinghouse Air Brake Company, Pittsburgh, Pa., will read a paper on The Effect of Changed Operating Conditions and Modern Rolling Stock on the Brake and What Is Being Done to Make This Money Saving or Money Losing Apparatus as Efficient as Heretofore.

American Society of Engineer Draftsmen.

At the next meeting of the American Society of Engineer Draftsmen, to be held in the Engineering Societies' building, New York, April 17, D. B. Heilman, Mem. Soc. E. D. (Philadelphia & Reading), will read a paper entitled, Teaching Legible Sketching for Shop Plans to the Operating Engineer and Machinist. This lecture will be illustrated by a projectograph.

Railway Signal Association.

The next meeting of the Railway Signal Association will be held at Hotel Astor, New York City, on Wednesday and Thursday, June 11 and 12, the dates having been changed from the tenth and eleventh by a recent decision of the Board of Direction.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 20, Chicago.
 AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.
 AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Annual meeting, June 17-20, Buffalo, N. Y.
 AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.
 AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
 AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 21, New York.
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.
 AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.
 AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 11-13, Atlantic City, N. J.
 AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.
 AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.
 AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
 AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
 AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.
 ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago. Next meeting, May, 1913, Baltimore, Md.
 ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June, 1913, Atlantic City, N. J.
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.
 ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
 ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y. Annual meeting, October 8, Philadelphia, Pa.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.
 CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.
 CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.
 CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.
 ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
 ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, June 18, Bluff Point, N. Y.
 GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.
 INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.
 INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual meeting, May 21-24, Chicago.
 INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 15-18, Chicago.
 INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.
 MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.
 MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.
 MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 16-18, Atlantic City, N. J.
 MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.
 NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.
 NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
 NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
 NORTHERN RAILROAD CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.
 PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Thursday.
 RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
 RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.
 RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.
 RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.
 RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.
 RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.
 RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Meetings, June 10-11, New York; convention, October 14, Nashville, Tenn.
 RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Annual convention, May 19-21, Chicago.
 RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.
 RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.
 RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.
 ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.
 ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.
 SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
 SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.
 SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Next meeting, April 17, Atlanta, Ga.
 SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.
 TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.
 TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.
 TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
 TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
 TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
 TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.
 TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago. Annual meeting, June 17, Los Angeles, Cal.
 TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.
 TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.
 TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.
 UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.
 WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.
 WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
 WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The meeting of the Western Classification Committee, which is expected to last for several weeks, was begun at St. Louis on April 1.

F. R. Stevens, agriculturist of the Lehigh Valley, who goes around among the farmers responding to their requests for information, says that he has already traveled in his automobile 20,000 miles on these errands.

The Canadian Pacific has restored the uniform rate of one dollar a day, demurrage, on freight cars, the rates of two dollars and three dollars which have been in force since the scarcity of cars last autumn being now discontinued.

The Grand Trunk reports 3,000 passengers leaving Montreal in the last two weeks in March in eleven special trains, for Ontario and points in Western Canada, all these passengers having come from Europe by way of Portland, St. John to Halifax.

The Southwestern Passenger Association, Western Passenger Association, Southeastern Passenger Association, and Central Passenger Association have authorized a special rate of two cents a mile to St. Louis for the Fourth Annual Peace Congress to be held on May 1, 2 and 3.

"Trade and Traffic" is the name of a new monthly publication, the first number of which has just been issued at Tampa, Fla., by L. T. & B. E. Calkins. A sub-title reads "Finance and Real Estate." The editor has at least two of the essential qualifications; he knows how to write and he is familiar with railway freight traffic.

At Williamsburg, Ky., the Adams Express Company has been fined in court \$1,475 on nineteen charges of delivering liquor in territory where its sale is forbidden, the action of the express company being alleged to be contrary to the provisions of the federal law recently passed by Congress, regulating the interstate movement of liquors.

Somebody has figured out that the freight carried through the Soo canal in 1912, 72½ million tons, troubled the waters there about every 15 minutes. The number of cargoes, 20,000, means large ships, 3,625 tons on the average. At that it involves 85 ships a day for the season of 236 days. In 100-ton boats, such as used to be common, it would mean 725,000 vessels a year, 3,060 a year through the season, 180 an hour at the height of trade, or one every 20 seconds. By caravan, five camels to the ton, this would require 364½ million camels a year, or a million a day, or with the restricted season nearly 1.5 million a day. At the busiest there would be 91,125 camels an hour.

The Pennsylvania State Railroad Commission has before it complaints from two teamsters in Philadelphia, who claim that they are discriminated against at the freight houses of the Pennsylvania Railroad and the Philadelphia & Reading, in Philadelphia. One of the two complainants has proceeded against the Pennsylvania, and the other against the Reading; and the Philadelphia Team Owners' Association is aiding the prosecution on behalf of both. It is claimed that freight coming to the freight houses in the cars is piled up indiscriminately and is often so covered by other goods that the teamsters have to waste much time in getting what they want. They demand that the employees of the railroad shall truck the freight to the wagon door. The complaint charges that packages for the large stores which do their own trucking are sorted and placed near the doors where the teamsters can get them easily. It is claimed that tailboard delivery—that is, delivery of the freight close to the point where the wagon backs up—is in vogue in Chicago, Cleveland, Buffalo, Rochester, St. Louis and Minneapolis.

Chicago Street Traffic.

A subcommittee of the Chicago Association of Commerce has submitted to the association a report on the teaming, transfer, express and storage interests of Chicago, in which it is stated that more than 250,000 tons of freight are hauled through the streets of Chicago daily, making a total approaching 100,000,000 tons a year. This represents an annual business of more than

\$60,000,000, and an investment in excess of \$85,000,000. According to the report more than 10,000,000 tons of coal are trucked through Chicago streets annually. Structural steel, brick, sand, ice, general merchandise, produce, packinghouse products and milk, are among the other commodities that are large factors in the total. The number of vehicles registered with the city authorities in 1912 was 80,000, an increase of 11 per cent. The increase in capacity was still greater. Of these vehicles more than 50,000 are horsedrawn wagons and trucks, and 2,790 are automobile trucks. The number of motor trucks carrying less than one ton increased from 922 in 1911, to 1,554 in 1912, while the number carrying over one ton increased from 656 to 1,018.

INTERSTATE COMMERCE COMMISSION.

Fred W. Sweney, of Chicago, has been appointed chief examiner of accounts for the Interstate Commerce Commission, to succeed Charles A. Lutz, who recently resigned to become comptroller of the United States Express Company. Mr. Sweney has been an employee of the commission several years.

The commission has suspended from March 31 until July 29, certain items in a supplement to Agent W. H. Hosmer's tariff, which contain increased rates for the transportation of linseed oil cake and meal and flaxseed screenings from Minneapolis, Minn., and other points to gulf ports.

The commission has suspended from March 31 until September 30, a supplement to the tariff of the Minneapolis & St. Louis, which contains increased rates applicable to the transportation of grain, grain products and seeds from Aberdeen and other stations in South Dakota to Duluth, Minn.

The commission has suspended from March 27 until July 25, an item naming increased rates on flour, in carloads, from points in Kansas and other western states to California terminals, published in supplements to certain tariffs. The present rate from Atchison to San Francisco is 65 cents per 100 lbs., and the proposed rate is 75 cents. An increase of 10 cents per 100 lbs. is also proposed from various other points.

The commission has suspended certain schedules contained in supplements to Agent R. H. Countiss' tariff, which would advance rates on lumber and shingles from Pacific coast points, including San Francisco, to certain points in Colorado, Wyoming and Texas. For example, it was proposed to cancel the present through rate of 50 cents per 100 lbs. on lumber moving from San Francisco to Dalhart, Tex. The combination of local rates applicable would be 30 cents to Los Angeles plus 50 cents from that point to Dalhart, making an advance of 30 cents per 100 lbs. Like advances would result between other points.

Complaint Dismissed.

James J. McLoughlin v. Texas & Pacific et al. Opinion by the commission:

The complainant contends that the rate charged for the transportation of hay from Eudora, Ark., to New Orleans, La., was unreasonable. Reparation was asked. The commission found that the evidence was not conclusive. (26 I. C. C., 307.)

Alfred Struck Company v. Louisville & Nashville et al. Opinion by the commission:

The commission found that the charges on shipments of doors and window frames, set up, from Louisville, Ky., to Galveston and Houston, Tex., Chattanooga and Memphis, Tenn., and Atlanta, Ga., were not unreasonable. (26 I. C. C., 469.)

Memphis Bureau v. Louisville & Nashville et al. Opinion by Commissioner McChord:

The complainant contended that the rate of \$1.10 per ton on coal from western Kentucky and Alabama mines was unreasonable to the extent that it exceeded \$1.00 per ton. The commission found that the evidence was not conclusive. (26 I. C. C., 402.)

Board of Trade of Cheraw, S. C., et al. v. Seaboard Air Line et al. Opinion by the commission:

The complainant attacks the class and commodity rates from all directions to Cheraw, S. C., alleging that they are unreasonable and prejudicial as compared with the rates to Wadesboro

and Monroe, N. C. The commission found that the evidence was not conclusive. (26 I. C. C., 364.)

Stewart & Clark Manufacturing Company v. Atchison, Topeka & Santa Fe et al. Opinion by the commission:

The complainant contends that the rating of double first class on speedometers in western classification was unreasonable. Reparation is asked on shipments in less than carloads from Chicago to San Francisco and Los Angeles, Cal. The commission found that the evidence was not conclusive. (26 I. C. C., 361.)

Wholesale Produce Dealers Association of Brooklyn, N. Y., v. Long Island Railroad. Opinion by the commission:

The complaint attacking the defendant's track-storage charges exacted at certain delivery tracks in Brooklyn, N. Y., was dismissed, the evidence showing that members of complainant association use defendant's cars for warehouse purposes. The charges themselves were not found to have been unreasonable. (26 I. C. C., 413.)

Cal Hirsch & Sons Iron & Rail Company v. Washington, Baltimore & Annapolis Electric et al. Opinion by the commission:

The complainant contends that the rate of 77½ cents per 100 lbs. for the transportation of less-than-carload shipments of school desks and other articles from Annapolis, Md., to East St. Louis, Ill., are unreasonable. The commission decided that the evidence was not conclusive. (26 I. C. C., 480.)

Essex Granite Company et al. v. Southern Railway Company et al. Opinion by the commission:

Between June 24 and July 2, 1909, complainants shipped 43 carloads of granite paving blocks from Granite Quarry, N. C., to Chicago, upon which the defendants charged a joint rate of \$3.30 per net ton. The intention of the carriers was to reduce this rate to \$3.10 per ton, effective June 24, but the reduction was not accomplished until July 3. Upon a petition alleging that the rate of \$3.30 per ton from Granite Quarry to Chicago was unreasonable, the commission decided that the mere agreement of the parties with respect to a rate, or the mere subsequent reduction of a rate, is not sufficient ground for a finding of unreasonableness. (26 I. C. C., 449.)

Reparation Awarded.

The Board of Railroad Commissioners of the state of Montana, in behalf of Frank W. Campbell, v. Northern Pacific et al. Opinion by the commission:

The commission decided that the charges of 65½ cents per 100 lbs. on a carload of emigrant movables from Edmunds, N. Dak., to Shawmut, Mont., were unreasonable, to the extent that they exceeded 51 cents per 100 lbs., and prescribed that rate for the future. (26 I. C. C., 482.)

Capital Electric Company v. Baltimore & Ohio Chicago Terminal. Opinion by the commission:

The commission decided that the rate of 95 cents per 100 lbs. charged by defendants for transportation of a carload of enameled-iron conduit pipe from Harvey, Ill., to Salt Lake City, Utah, was unreasonable to the extent that it exceeded 75 cents per 100 lbs., and prescribed that rate for the future. (26 I. C. C., 472.)

Rates on Hoops Reduced.

Disher Hoop & Lumber Company v. St. Louis & San Francisco et al. Opinion by the commission:

The commission decided that the rate of 6½ cents per 100 lbs. on coiled elm hoops from Chaffee, Mo., to Thebes, Ill., was unreasonable to the extent that it exceeds 4 cents per 100 lbs., and prescribed that rate for the future. Reparation was awarded. (26 I. C. C., 488.)

Minimum Weight Reduced.

Josiah Partridge & Sons Company et al. v. Pennsylvania Railroad et al. Opinion by the commission:

The commission decided that the maintenance of minimum carload weight of 10,000 lbs. on chairs, n. o. s., set up, from Lewisburg, Pa., to Jersey City, N. J., was unjustly discriminatory against complainants and unduly preferential to shippers from

other points from which the same commodity is transported under a minimum carload weight of 8,000 lbs., and prescribed that minimum for the future. (26 I. C. C., 484.)

Reconsigning Charges Reduced.

C. C. Justice Company v. Pennsylvania Railroad. Opinion by the commission:

The commission decided that the charge of \$5 per car for reconsigning carloads of green tomatoes at Altoona, Pa., was unreasonable to the extent that it exceeded \$2 per car, and prescribed that charge for the future. Reparation was awarded. (26 I. C. C., 478.)

Hardware Rates Reduced.

McGregor-Noe Hardware Company v. St. Louis & San Francisco. Opinion by the commission:

The commission decided that the rates for the transportation of less-than-carload shipments of band and boiler iron, corrugated iron, horse and mule shoes, wire, woven-wire fencing, nails and spikes from Springfield, Mo., to certain local points in Missouri and Arkansas were unreasonable to the extent that they exceeded commodity rates formerly in effect, and prescribed those rates for the future. (26 I. C. C., 466.)

Switching Charges Not Increased.

In re switching charges at Sheffield, Minn. Opinion by Commissioner Prouty:

The commission decided that the proposed advance from \$3 per car to \$5 for switching grain and grain products by Chicago Great Western between the interchange track of the Chicago, Rock Island & Pacific and the mill of protestant at Sheffield, Minn., was not justified, and that a charge of not exceeding \$3 might properly be made for the switching of the loaded car and \$1.50 for the movement of the empty car. (26 I. C. C., 475.)

Passenger Fares Increased.

In re Fares from Suburban Points on the Washington-Virginia Railway to Washington, D. C. Opinion by Commissioner Prouty:

The suspended tariff increases the passenger fares from stations on the line of the Washington Virginia Railway in Virginia, Petty to Green Valley, inclusive, to points in Washington, D. C., from 10 cents to 15 cents. The commission found that the suspended tariff contained prices for family and commutation tickets which would enable passengers to travel at a lower rate than is possible under the rates now in effect, and that the results of the suspended tariff would probably be to cheapen rather than enhance the cost of transportation. The order of suspension was vacated. (26 I. C. C., 398.)

Joint Rates Established.

Texas Cement Plaster Company v. St. Louis & San Francisco et al. Opinion by the commission:

The complainant alleges that the failure of the Kansas City, Mexico & Orient, and the St. Louis & San Francisco to establish joint through rates on cement plaster from Plasterco, Tex., to destinations on the line of the St. Louis & San Francisco results in unjust discrimination against its product. The commission decided that the defendant should be required to establish joint rates from said point of origin to points on the line of the St. Louis & San Francisco not exceeding those contemporaneously maintained from Acme, Tex., to the same destinations. (26 I. C. C., 508.)

Colorado Passes.

In re issuance and use of passes, franks and free passenger service. Opinion by Commissioner Harlan:

The commission found that with the single exception of the Chicago, Burlington & Quincy, the railroads in Colorado until last November were violating the law respecting the issuance of free passes. Annual system passes were freely issued to persons who had only a nominal connection with the railroads and trip passes for the families of such persons were also furnished. Free state passes were readily granted to prominent interstate shippers, but the occasional shippers rarely received

such favors. Public officials, particularly those who favored the railroads, also obtained passes without difficulty. The commission held that an intrastate pass unlawfully given to an interstate shipper was a step toward the purchase of his traffic. The proper rules restricting the use of the passes were printed on the back of the passes, but the commission decides that as these instruments by which the purposes of the law might be defeated had been voluntarily distributed by the carriers, it was the duty of the carriers to protect its facilities and services against the improper and unlawful use of the passes by proper policing. The railroads had been eager to abolish these practices, but each was afraid to start the movement on account of the loss of traffic which was sure to follow. The Burlington alone broke away; and it did this at a loss, which would have been much greater if its lines had been differently located. The investigation of the commission enabled the carriers to stop these practices without requiring any particular carrier to assume the burden with its shippers of initiating the movement. The carriers readily agreed to conform their practices in the future to the rulings of the commission, and since the investigation was commenced they have taken steps with that end in view. Other reports on this investigation will be issued when it has been determined just how far prosecutions must follow the disclosures. (26 I. C. C., 491.)

Demurrage Charges Properly Assessed.

Leo P. Harlow, trustee, v. Washington Southern. Opinion by the commission:

The complainant contends that the demurrage charges paid upon certain shipments of cottonseed oil consigned to the Cotton Oil Company at Relee, Va., were excessive. Reparation is asked. The complainant is trustee in bankruptcy for the Columbia Cotton Oil & Provision Corporation. This corporation has private tracks at Relee capable of holding about 35 cars, and asked the defendant to store the cars consigned to it on these private tracks in order to avoid demurrage charges. The shipments in question were on order-notify bills of lading. An order-notify shipment is a notification to the carrier that title to the consignment is retained by the consignor until delivery of the bill of lading properly endorsed. Ordinarily the order-notify bill of lading is forwarded to the bank with a sight draft attached for the value of the shipment, and the person notified at destination can only obtain possession of the bill of lading by payment of the draft. The carrier cannot without incurring liability deliver such shipment until the bill of lading is properly surrendered. The delivering carrier did not surrender possession of these cars until the bills of lading for them were surrendered. Neither did it store the cars as requested, for such action might have resulted in the carrier becoming liable to the consignor, and moreover, such delivery would not have stopped the accrual of demurrage charges under the tariff. The commission decided that the delay in presenting the bills of lading was the fault of the bankrupt corporation, and that the demurrage charges were properly assessed. The complaint was dismissed. (26 I. C. C., 511.)

Investigation of Fiber Packing Boxes.

Examiner Boyle, of the Interstate Commerce Commission, began a hearing at Chicago on April 4, in the case of R. W. Pridham Company, of Los Angeles, vs. the Southern Pacific, et al., involving the reasonableness of the eastbound commodity rates out of California which are higher for commodities packed in fiber board boxes than for the same articles packed in wooden boxes. Although the complainant rested his case at the hearing in Los Angeles several months ago, the associations representing the fiber box manufacturers, the wooden box manufacturers, and the users of fiber board containers have filed interventions in the case, and Examiner Boyle stated that it has now assumed practically the attitude of a general investigation by the commission of the entire subject of substitutes for wooden boxes.

Luther M. Walter, the attorney representing the fiber box manufacturers, stated that, except in the rates from California, no discrimination is made between fiber board and wooden boxes. The first witness was J. B. Fellows, president of the Illinois-Michigan Fiber Box Company, who testified at length regarding the history of the development of the fiber package as a freight container, which he was the first to manufacture with-

out wooden edges. His company is now making between 4,000,000 and 5,000,000 boxes a year, and receives no complaints against the fiber box for transportation purposes from its customers. It is decidedly to the interest of the manufacturer, he said, that the box shall be satisfactory, and therefore the product is tested during manufacture every half hour, and no effort is made to market the boxes for the transportation of bulk freight, or for commodities or conditions for which it is unsuited. For the articles customarily shipped in such boxes he considered that fiber made as satisfactory a container as wood, and he promised to submit a list of such commodities.

Several shippers who have used large numbers of fiber boxes strongly defended them as against wooden boxes, except under certain conditions, such as those which must be met by ocean freight that often has to be rehandled several times, and declared the fiber box superior to wood for many kinds of shipments. Photographs taken in warehouses showing the condition of fiber boxes and wooden boxes under various circumstances were introduced in evidence.

STATE COMMISSIONS.

The railroad and warehouse commission of Missouri has rescinded its order dated March 19, refusing to approve Western Classification No. 51 and declaring that Western Classification No. 50 would remain in effect. The reason given is that under the operation of the new law the commission will cease to exist on April 15, and within that short period it will not have time to make such investigation as the importance of the questions involved will require. It is concluded that the matter of the approval or disapproval of Classification No. 51 should be taken up by the new public service commission.

The railroad commission of Louisiana has issued a circular, No. 419, announcing its intention to order the introduction of the block system on all railroads in the state, except those less than 25 miles long, and except those which run only one train a day each way. The circular says that the three important roads in the state which already have block signals are operating their trains under the system "with splendid results." All roads are called upon to send to the commission, before April 30, a statement of what accidents have occurred on their lines during the past five years; a list of telegraph offices with the distances between them, and showing also stations which have no telegraph; also the number of regular trains run each way daily.

The Public Service Commission of Maryland in a case against the Northern Central, decides that a local passenger train, carrying intrastate passengers, may not rightfully be sidetracked to allow an express train, behind time, carrying interstate passengers, to run ahead of it. It was contended by the railroad company that the commission had no right to issue an order that might interfere with the running of its through trains engaged in interstate traffic. The commission took the ground that the schedule for the local train belongs to it when it is running on that time, and not to a belated express train, and, in brief, that the rights of the passenger traveling wholly within the state are equal to those of the passenger from without the state, and that the railroad's time table in this respect is its contract with the passenger.

The Public Service Commission of Missouri.

The law of Missouri abolishing the Railroad and Warehouse Commission, and establishing a Public Service Commission with extensive powers, goes into effect April 15. This law, which was Senate bill No. 1, fills 149 pages, and the powers granted to the new commission embrace apparently everything of a radical nature which is to be found in the laws of New York and the other states which have adopted new statutes concerning transportation and other public utilities during the past few years. Street railroads, gas companies, electric light, water, and express companies, telephone and telegraph companies are dealt with at great length. The term of each of the five commissioners will be six years. They must have been citizens for five years and must be 25 years old. The governor in making appointments designates the chairman. The governor also appoints a general counsel for a term of six years, but the commission appoints its own secretary. The commissioners during their terms are to reside at Jefferson City. Their salaries will be \$5,500 each;

that of the general counsel \$4,500; and that of the secretary \$3,600. The commissioners and their employees are forbidden even to suggest the appointment of any person to a place under any corporation subject to the supervision of the commission. Among the detailed powers granted to the commission is a clause authorizing it to order the construction of side tracks to industries. It may prescribe the time in which express packages are to be received and when delivered, and the limits of delivery territory. The commission may order railroads to provide a suitable car to be used in testing track scales, the expense to be apportioned, by the commission, among the different railroads. The commissioners and their employees may ride on trains and engines by paying fare, and on reasonable notice may have the use of an inspection locomotive, or a special locomotive and an inspection car, once a year. In adjusting rates for passengers or freight, the commission is to "have regard among other things to a reasonable average return on the value of the property used in public service and to the necessity of making reservation out of income for surplus and contingencies." The commission may order the restoration of reduced fare passenger tickets which have been discontinued within five years past. Connecting railroads may be ordered to form through lines, and if necessary the commission may order the construction of a connecting track. The commission may suspend new tariffs, but not for more than 120 days.

No road shall hereafter be constructed across a railroad track, nor a railroad across a public highway, nor a railroad across another railroad, without the permission of the commission; and the commission has the right to refuse consent. The commission may ascertain the value of the property of every railroad, street railroad and common carrier, and may make revaluations from time to time. The commission may order the installation, maintenance and operation of appropriate safety devices, including interlocking and block signals, and to establish uniform or other standards of equipment.

About half of the pages of the law are taken up with provisions relating to gas, electric light and telegraph companies.

The Railroad and Warehouse Commission having been abolished, a new law has been passed, House bill No. 516, creating the office of warehouse commissioner and regulating the inspection and weighing of grain.

COURT NEWS.

In the superior court at Bridgeport, Conn., on Tuesday of this week, Judge Greene began the trial of officers of the New Haven road charged with criminal negligence in connection with the derailment at Westport, October 3, last; Messrs. H. J. Horn, B. R. Pollock, C. N. Woodward and L. J. Carmalt.

The attorney general of Missouri has announced that quo warranto proceedings will be filed in the state supreme court to oust the St. Louis & San Francisco from control of the Kansas City, Clinton & Springfield, a line running from Kansas City to Springfield, on the ground that it is a parallel and competing line.

The Supreme Court of the United States, in the case of McGinnis, a locomotive engineer, killed while running the engine of a train of the Gulf, Colorado & Santa Fe, holds that married daughters of railroad employees may not enjoy benefits under the federal employers' liability law in case of the negligent killing of the father. Justice Lurton, for the court, reversed a verdict of \$15,000 awarded the widow and children. The decision holds that the employers' liability law grants benefits only to those who are shown to have suffered loss.

The supreme court of the United States, this week, in the case of the Mine Hill & Schuylkill Haven railroad decided that where the property of a corporation is leased to another, and the owning company has no income except the rental, it is not doing business, in the contemplation of the federal corporation tax law, and therefore is not liable to pay the corporation tax. A dissenting opinion was rendered by Justice Pitney, in which Justices Day, Hughes and Lamar concurred. Justice Pitney holds that in investing their receipts, the directors of the owning company "do business."

In the county court at Greenville, Ky., last week, forty suits were entered against the Illinois Central seeking damages for the failure of the road to furnish cars to coal operators in

Muhlenberg county. The plaintiffs are workmen in the mines and their suits are based on the charge that the company, in failing to perform a public duty, failed in its duty to them, the miners, as members of "the public." The attorney for the plaintiffs says that 1,800 suits will be filed. All of the suits thus far filed are for small amounts, the basis of each claim being that the plaintiff has been deprived of work because of the absence of cars.

The Supreme Court of the United States has reversed the Federal Court in Alaska which annulled five of the six counts of an indictment against the Pacific & Arctic Railway & Navigation Company and others charged with violating the anti-trust law and interstate commerce law, in regard to Alaska transportation facilities. All the counts charged in varying form that the railroad from Skagway to the headwaters of the Yukon had entered into a conspiracy with steamship lines to destroy the competition of independent steamship lines, such as the Humboldt Steamship Company, by charging the independent lines higher rates and refusing to make joint rates with the independents. The Alaska court held that before it could have jurisdiction over the case the alleged discrimination should be passed upon by the Interstate Commerce Commission; but this view is now rejected and the case goes back for trial.

The commerce court has denied the petition of the Atchison, Topeka & Santa Fe asking the court to set aside the order of the Interstate Commerce Commission reducing from \$30 to \$7.50, the company's charge per car for refrigerating oranges and lemons, where such fruits are pre-cooled and pre-iced by the shipper. The carriers denied that shippers had any right to ice cars, as in so doing they took out of the hands of the carrier a part of the transportation service, the law having declared that refrigeration or icing is an element of transportation. The court finds that the railroads get greater revenue per car, and per ton of load, when the shippers pre-cool and pre-ice the fruit. Transportation is more economical where the fruit is pre-iced, as then the boxes can be packed more closely together in the car. The roads, however, evidently want the privilege of furnishing the ice themselves, though it appears that the commission would probably rule that any such service, performed by the carrier, must be done at cost or a very small advance on cost. The court justifies the commission in holding that the shipper has a right to pre-cool the fruit and pre-ice it, at least until the railroads offer a substitute which would be fairly equivalent in cost and efficiency.

Anthracite Coal Case.

The Supreme Court of the United States in the anthracite coal case, recently decided, has directed that its decree be amended so as to give the district court power to decide whether four certain "65 per cent. contracts" should be excepted from the decision which held that such contracts were void. The Supreme Court held that the contracts whereby the railroad coal companies bought the output of independent operators at 65 per cent. of the price of coal at tidewater, suppressed competition and violated the Sherman anti-trust law.

The Delaware, Lackawanna & Western Railroad, the Hillside Coal and Iron Company, the New York, Susquehanna & Western Coal Company and the Pennsylvania Coal Company maintained that their contracts did not suppress competition.

Justice Lurton, explaining that the court had been asked to exempt five contracts from the effect of the decision, said: "We find there is inadequate evidence before us to pass upon four of these contracts. Therefore we modify the decree so as to allow the District Court to take evidence and pass upon the point. The attorney-general is willing to have the decree amended so as to exempt the contract between the Pennsylvania Coal Company and the Elk Hill Coal and Iron Company. We amend the decree so as to exempt this contract."

SUBWAY FOR GENOA, ITALY.—Genoa is confined to a comparatively narrow territory, between the mountains and the sea, and can only grow at the two ends. Two engineers, E. Ravà and S. Cattaneo, have planned a subway and elevated railway to serve it, from a suburb on the west to one on the east, a distance of a little over 6 miles, about three-fourths of which will be underground. The cost is estimated at \$5,000,000.

Railway Officers.

Executive, Financial and Legal Officers.

W. H. Emerson has been appointed acting freight claim agent of the Chicago & Eastern Illinois, with headquarters at Chicago.

C. B. Ferry, assistant secretary of the Chicago, Milwaukee & St. Paul, at New York, has been elected vice-president, with headquarters at New York. Mr. Ferry will also continue to act as assistant secretary.

E. H. McHenry, vice-president in charge of the engineering department of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., has resigned, effective May 1.

The following appointments are announced on the Chicago, Milwaukee & St. Paul: G. J. Bunting and J. Welch, assistant general auditors; R. N. Dudley, ticket auditor, and W. M. Harvey, auditor of material accounts; all with headquarters at Chicago.

Carl Remington, assistant to chairman of the Chesapeake & Ohio and the Hocking Valley, at New York, has been appointed secretary of those roads, succeeding James Steuart MacKie, who remains as treasurer of both roads, with headquarters at New York. Mr. Remington has been appointed secretary also of the Missouri, Kansas & Texas.

C. N. Whitehead, secretary and treasurer of the Missouri, Kansas & Texas, at New York, has been appointed assistant to president, with headquarters at St. Louis, Mo. Carl Remington has been appointed secretary, with headquarters at New York, and Frank Johnson, local treasurer at St. Louis, has been appointed treasurer, with headquarters at St. Louis, succeeding Mr. Whitehead, effective April 16.

J. W. Taylor, who recently was appointed assistant to the president of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, as has already been announced in these columns,



J. W. Taylor.

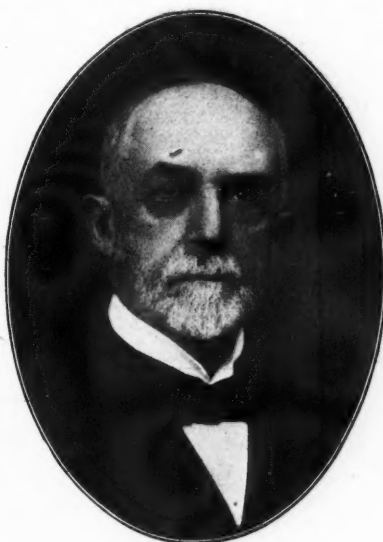
succeeding E. D. Sewall, who has been elected vice-president.

Angus Daniel McDonald, deputy comptroller of the Southern Pacific Company at New York, has been appointed vice-president and comptroller, with headquarters at New York, succeeding William Mahl, retired under the pension rules of the company. Mr. McDonald was born on April 14, 1878, at Oakland, Cal., and was educated at various schools and at the University of Notre Dame. He began railway work January 8, 1901, with the Galveston, Harrisburg & San Antonio, and from September, 1904, to November, 1907, was chief clerk in the accounting department of the Southern Pacific Company at San Francisco, Cal. From December, 1907, to November, 1908, he was auditor of the Los Angeles Pacific Company, and then for one year was auditor of the Pacific Electric Railway Company, at Los Angeles. In January, 1910, he was appointed auditor of the Southern Pacific Company, at San Francisco, and three years later was made

deputy comptroller at New York, which position he held at the time of his appointment as vice-president and comptroller of the same company, with headquarters at New York, as above noted.

William P. Newton, whose appointment as general auditor of the St. Louis & San Francisco, with headquarters at St. Louis, has already been announced, was born October 4, 1854, at Portersville, Pa. He was educated in private schools and began railway work in May, 1875, with the Leavenworth, Lawrence & Galveston, now a part of the Santa Fe, and the Kansas City, Ft. Scott & Gulf, now a part of the Frisco. From May, 1877, to May, 1879, he was auditor, secretary and treasurer of the Joplin Railroad, now a part of the Frisco, at Girard, Kan., and from the latter date to March, 1881, was traveling auditor for the St. Louis & San Francisco. He was then chief clerk and general bookkeeper until September, 1900, when he was appointed assistant general auditor, which position he held until his recent promotion to general auditor, as above noted.

William Mahl, vice-president and comptroller of the Southern Pacific Company at New York, voluntarily retired on April 7,



W. Mahl.

under the pension rules of the company, after 53 years' continuous railroad service, 31 of which were in the service of the Southern Pacific Company. Mr. Mahl was born in Carlsruhe, Baden, December 19, 1843, and came to America with his parents in 1852. In 1860 he was entered as an apprentice in the shops of the Louisville & Nashville. In four years he became successively a machinist, a draftsman and chief clerk in the mechanical department. From 1864 to 1872 he was auditor and purchasing agent of the Louisville, Cincinnati & Lexington. For a few years he served under Colonel Thomas A. Scott as auditor, purchasing agent and financial agent of the Texas & Pacific. Soon after the panic of 1873 he returned to the Louisville, Cincinnati & Lexington, becoming its general superintendent. In February, 1882, Mr. Huntington called him to New York, where he served successively as general agent, comptroller and assistant to the president of the Chesapeake & Ohio and the Southern Pacific and the various collateral railways, steamship lines and other large interests of Mr. Huntington. After Mr. Huntington's death Mr. Harriman continued and extended Mr. Mahl's functions so as to cover the entire Union Pacific and Southern Pacific systems. He was vice-president and comptroller of both systems from October, 1909, until the Union Pacific and the Southern Pacific were separated under an order of the Supreme Court; and on February 6, 1913, resigned from the Union Pacific.

Operating Officers.

M. J. Kelley has been appointed superintendent of the Chicago, West Pullman & Southern, in charge of operating, maintenance of way and of equipment, with headquarters at Chicago.

Arthur B. Shafer, acting superintendent of the New York, Susquehanna & Western, at Jersey City, N. J., has been appointed assistant superintendent of the New York, Susquehanna & Western and the Wilkesbarre & Eastern.

R. H. Tuttle, superintendent of the Arizona division of the Atchison, Topeka & Santa Fe Coast Lines at Needles, Cal., has been appointed superintendent of the Albuquerque division, succeeding E. J. Gibson, resigned to go to another company, and J. A. Christie, trainmaster at Fresno, succeeds Mr. Tuttle.

J. H. Brinkerhoff, heretofore terminal superintendent of the Illinois Central at Chicago, has been appointed general superintendent of the Belt Railway of Chicago. The position of general

manager on the Belt Railway has been abolished, and J. M. Warner, who has been general manager of both the Belt Railway and the Chicago & Western Indiana, will be general manager of the Chicago & Western Indiana. R. W. Stevens, who has been superintendent of the Belt Railway, has been appointed superintendent of the Chicago & Western Indiana, all with headquarters at Chicago.

Charles E. Brower, who has been appointed superintendent of the Atlanta, Birmingham & Atlantic, with headquarters at Fitzgerald, Ga., as has been announced in these columns, was born on August 20, 1873, at Franklinville, N. C. He received a college education, and began railway work in October, 1893, with the Cape Fear & Yadkin Valley, and for six years was in the service of that company, first as a telegraph operator and later as train despatcher. He was out of railway work during the two following years, and then entered the service of the Southern Railway. On July 17, 1902, he was appointed despatcher on the Atlanta, Birmingham & Atlantic, and on March 15, 1906, was promoted to trainmaster, which position he held until his appointment on March 1, as superintendent of the Brunswick division of the same road.



C. E. Brower.

E. Richards, whose appointment as superintendent of the St. Louis Southwestern, with headquarters at Pine Bluff, Ark., has already been announced in these columns, began railway work in 1881 as a telegrapher for the Chicago & Alton. Subsequently he was similarly employed on the Wabash and the Mexican National until 1884, when he went to the St. Louis Southwestern, and remained with that road until 1898, serving successively as telegraph operator, train despatcher, chief train despatcher and trainmaster. From 1899 to 1901 he was general manager of the Louisiana & Arkansas, and during the latter year was a train despatcher for the Chicago & North Western at Boone, Iowa, and chief train despatcher for the Choctaw, Oklahoma & Gulf at McAlester, Okla. Mr. Richards returned to the St. Louis Southwestern of Texas in 1902 as chief train despatcher at Mount Pleasant, Tex., leaving to go with the Louisiana Railway & Navigation Company as trainmaster at Shreveport, La., in 1905. He again became connected with the St. Louis Southwestern in 1907 as assistant superintendent at Pine Bluff, Ark., and was transferred to the Ft. Worth division as superintendent in October, 1912, which position he held until his recent appointment as superintendent at Pine Bluff, as above noted.



E. Richards.

F. J. Easley, assistant general manager of the first district of the Chicago, Rock Island & Pacific, with headquarters at Des

Moines, Iowa, has been appointed assistant general manager of the third district, with office at El Rero, Okla., succeeding T. H. Beacom, who takes the place of Mr. Easley. A. T. Abbott, superintendent of the Iowa division, with office at Des Moines, has been transferred to the superintendency of the Des Moines Valley division, with headquarters at Des Moines, succeeding C. L. Brown, assigned to other duties. E. J. Gibson, superintendent of the Atchison, Topeka & Santa Fe at Winslow, Ariz., succeeds Mr. Abbott at Des Moines.

H. J. Curry, trainmaster on the Boston division of the Boston & Albany, at Beacon Park, Allston, Mass., has been appointed superintendent of the Albany division, including the main line and all branches between Springfield, Mass., and Albany, N. Y., with headquarters at Springfield. S. H. Clark, superintendent of the Albany division at Springfield has been appointed assistant superintendent of both the Boston and the Albany divisions, with headquarters at Springfield, and he will have special charge of the examination department, with jurisdiction over both divisions from Boston to Albany. Sheridan Bisbee, road foreman of engines, has been appointed trainmaster at Beacon Park, succeeding Mr. Curry.

Traffic Officers.

John S. Talbot has resigned as general western agent of the Western Maryland at Chicago.

George A. Blair has resigned as general traffic manager of the Chicago & Alton, to become assistant freight traffic manager of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago.

In addition to his duties as mail traffic manager of the Southern Pacific, H. P. Thrall has been appointed inspector of transportation service in its relation to the public, with headquarters at San Francisco.

C. J. Jones, formerly traffic manager of the Copper River & Northwestern and the Alaska Steamship Company, has been appointed general freight agent of the Southern Pacific, with headquarters at San Francisco, Cal.

E. M. Linzee has been appointed milk agent of the Chicago & Alton, with temporary headquarters at Springfield, Ill. As soon as the new station building is completed Mr. Linzee will have his headquarters at Bloomington, Ill.

W. E. Prendergast, assistant general freight agent of the Chicago, Milwaukee & St. Paul, has been appointed general freight agent, with headquarters at Chicago, succeeding H. E. Pierpont, recently promoted to freight traffic manager.

D. W. Agnew, soliciting freight agent of the Georgia Southern & Florida, at Cincinnati, Ohio, has been appointed commercial agent, with office at Valdosta, Ga., succeeding T. J. Cumming, resigned, and C. T. Dabney succeeds Mr. Agnew.

Robert Ralston, soliciting freight agent of the Cincinnati, New Orleans & Texas Pacific, at Cincinnati, Ohio, has been appointed traveling freight agent, with headquarters at Cincinnati, succeeding Harry Langmead, resigned, and George W. Frank succeeds Mr. Ralston.

W. A. Barrows, division freight agent of the Boston & Albany, at Worcester, Mass., has been appointed assistant general freight agent. William Callahan succeeds Mr. Barrows, and J. J. Woodis has been appointed eastbound agent, with office at Boston, Mass.

M. E. Schnell, city passenger agent of the Chicago Great Western at Waterloo, Ia., has been appointed district passenger agent at Des Moines, Ia., succeeding D. E. Peterson, who has been appointed city passenger and ticket agent at that point in place of H. O. Post, resigned to engage in other business.

J. B. Keefe, assistant general freight agent of the Delaware, Lackawanna & Western, at New York, has been appointed industrial commissioner, with headquarters at New York. C. H. Drinkwater, contracting freight agent at Chicago, has been appointed commercial agent, with headquarters at Minneapolis, Minn., succeeding E. H. Eden, deceased, and K. E. Long succeeds Mr. Drinkwater.

E. B. Coolidge, general freight agent of the Wheeling & Lake Erie, has been appointed general coal and ore agent, with headquarters at Cleveland, Ohio, succeeding H. J. Booth, who has

been granted leave of absence. On his return Mr. Booth will take up special duties. R. F. Kelly, general passenger agent, has been made general freight agent also. T. J. McRoberts, chief clerk to the general passenger agent, has been appointed assistant general passenger agent, with office at Cleveland.

Engineering and Rolling Stock Officers.

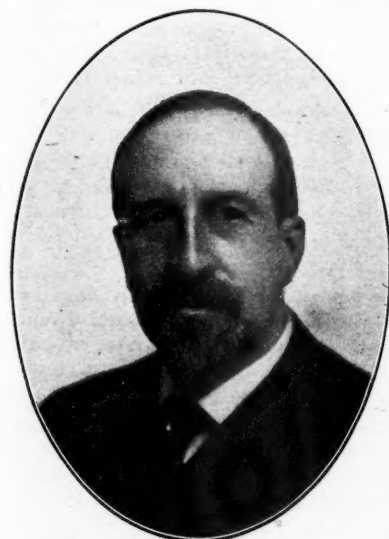
C. F. W. Felt, who, on April 1, became chief engineer of the Atchison, Topeka & Santa Fe system, with headquarters at Chicago, as already announced, was born April 29, 1864, at Salem, Mass.



C. F. W. Felt.

He was graduated from the Massachusetts Agricultural College in 1886, and began railway work in September of that year with the Atchison, Topeka & Santa Fe Railway. From September, 1886, to October, 1887, he was rodman and later until February, 1888, was bridge engineer. He was then for three months with the Denver & Rio Grande as levelman; from August, 1888, to April, 1889, instrument man for the Arizona & Southeastern, and from the latter date to February, 1890, transitman on the Topolobampo line in Mexico. In April, 1890, Mr. Felt was made resident engineer of the Northern division of the Gulf, Colorado & Santa Fe at Cleburne, Tex., and in July, 1892, he went to the Rio Grande & Southern as office engineer, returning to the Gulf, Colorado & Santa Fe in February, 1893, as division engineer. Three months later he was transferred to Galveston, Tex., as resident engineer, and in September, 1896, he was promoted to chief engineer of the Gulf lines of the Santa Fe at Galveston, which position he held for thirteen years, being advanced to chief engineer of the Eastern and Western lines, with office at Topeka, Kan., in November, 1909. He now becomes chief engineer of the entire system, as above noted.

C. A. Seley has resigned as mechanical engineer of the Rock Island Lines, effective May 1, to engage in a manufacturing business, the details of which will be announced later. This closes a career of 25 years of active railroad service.



C. A. Seley.

Mr. Seley was born December 26, 1856, at Wapella, Ill., and began railway work in 1879 as a draftsman for the St. Paul, Minneapolis & Manitoba. From 1881 to December, 1886, he was engaged in other work of a mechanical engineering nature, and then until January, 1888, was chief draftsman for the St. Paul & Duluth. The following four years he was with the Great Northern, and in May, 1892, he entered the railway supply business, returning to active railway service in March, 1895, as chief draftsman for the Chicago Great Western. He left the latter road in April, 1899, to become mechanical engineer of the Norfolk & Western, which position he held until May, 1902, when he was appointed mechanical engineer of the Rock Island Lines, with headquarters at Chi-

cago. Mr. Seley has been an active member of various railway associations in committee work, and has served as a member of the executive committee of both the Master Car Builders' and Master Mechanics' Associations for many years. For three years prior to January 1 last he was a member of the sub-committee of mechanical officers of the Special Committee on Relations of Railway Operation to Legislation, which conducted the negotiations between the railways and the Interstate Commerce Commission and the postoffice department on safety appliances, boiler inspection rules and steel postal car specifications. He acted as chairman of this sub-committee most of the time. Mr. Seley was president of the Western Railway Club in 1907 and 1908, and has been chairman of various committees. He is also author of many papers on railway electrification and on car, locomotive and boiler design. His varied experience has built up for him a very large acquaintance with railway mechanical officers and railway supply men throughout the country.

A. D. Case has been appointed engineer of structures of the Boston & Albany, with office at Boston, Mass., succeeding W. F. Steffens, resigned.

G. M. Rice, assistant engineer of the Chicago, Milwaukee & St. Paul, Puget Sound lines, has been appointed division engineer at Spokane, Wash., succeeding A. G. Holt, who was recently promoted to assistant chief engineer.

Samuel Lenzner, general foreman in the car department of the Michigan Central, has been appointed master car builder, with headquarters at West Detroit, Mich., succeeding D. C. Ross, and John Otto succeeds Mr. Lenzner.

J. W. Small, formerly assistant general manager (mechanical) of the Sunset-Central lines of the Southern Pacific, has been appointed superintendent of motive power of the Seaboard Air Line, with office at Portsmouth, Va., succeeding A. J. Poole, resigned.

OBITUARY.

John R. McCord, formerly traveling passenger agent of the Cincinnati, Hamilton & Dayton, died on April 2, at Washington, D. C., at the age of 59.

Richard R. Metheany, secretary and auditor of the Grand Rapids & Indiana, died suddenly at Grand Rapids, Mich., on April 7, aged 58 years. Mr. Metheany was born at Lima, Ohio, February 4, 1855, and had been in railway service since 1870, when he began as clerk in the auditor's office of the Grand Rapids & Indiana. From 1877 to October 1, 1895, he was chief clerk in the same office, and on the latter date was made secretary and auditor.

Charles E. Pugh, formerly first vice-president of the Pennsylvania Railroad, from which position he retired on March 1, 1911, under the pension rules of the company, died on March 8, at Old Point Comfort, Va. He was born at Unionville, Pa., on February 25, 1841, and entered the service of the Pennsylvania as agent at Newport, in October, 1859. He served as passenger conductor and train despatcher, and in 1870, was made general agent at Philadelphia. In April, 1879, he was appointed general superintendent of the Pennsylvania Railroad division; and in October, 1882, was made general manager. In March, 1893, he was elected third vice-president; and in February, 1897, second vice-president. This position he held for 12 years, being at the head of the operating department of the road, including motive power. He became first vice-president on March 24, 1909, in charge of the purchasing insurance, real estate and pension departments. He was also first vice-president of the Northern Central, the Philadelphia, Baltimore & Washington and the West Jersey & Seashore; and a director of the Long Island Railroad, and of many other companies in the Pennsylvania system. Mr. Pugh's character may be briefly epitomized by the following extract from a resolution of the directors, published in the *Railway Age Gazette*, when he retired from service: Endowed by nature with a happy combination of firmness of character and a most gentle and lovable disposition, he has ever been held in high esteem as well by the army of employees over whom he exercised authority as by his official associates; and the conspicuous loyalty of his subordinate officers is attributable as much to their personal affection for him as to the esprit de corps which is the stronghold of the Pennsylvania Railroad organization.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE GEORGIA RAILROAD is in the market for 6 locomotives.

THE WABASH has asked authority of the courts to purchase 30 locomotives.

THE LEHIGH VALLEY has ordered 25 locomotives from the Baldwin Locomotive Works.

THE GRAND TRUNK has ordered 25 mikado locomotives from the Baldwin Locomotive Works.

THE NORTHWESTERN OF BRAZIL has ordered 4 mogul locomotives from the Baldwin Locomotive Works.

THE PITTSBURGH & SHAWMUT has ordered 5 mikado locomotives from the Baldwin Locomotive Works.

THE BOSTON & MAINE locomotive inquiry comprises 20 switching locomotives and 40 Pacific type locomotives.

THE NEW YORK CENTRAL & HUDSON RIVER is having 43 consolidation locomotives converted into mikado locomotives by the American Locomotive Company.

THE LAKE SHORE & MICHIGAN SOUTHERN is having 14 consolidation locomotives converted into mikado locomotives by the American Locomotive Company.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 8 ten-wheel freight locomotives, 6 switching locomotives, 6 consolidation locomotives, and 3 ten-wheel passenger locomotives from the American Locomotive Company.

THE BOYNE CITY, GAYLORD & ALPENA has ordered 1 six-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 18 in. by 24 in., the diameter of the driving wheels will be 50 in. and the total weight in working order will be 106,000 lbs.

THE HAVANA CENTRAL, Cuba, has ordered 4 Pacific type locomotives from the American Locomotive Company. The dimensions of the cylinders will be 20 in. by 26 in., the diameter of driving wheels will be 62 in. and the total weight in working order will be 173,000 lbs. These locomotives will be equipped with superheaters.

CAR BUILDING.

THE HARRIMAN LINES will soon place an order for 201 passenger cars.

THE CHICAGO, MILWAUKEE & ST. PAUL is building 300 ore cars at its shops at Milwaukee, Wis.

THE BOSTON & MAINE freight car inquiry comprises 1,500 gondola cars and 4,500 box cars.

THE CHICAGO & WESTERN INDIANA has ordered 300 ballast cars from the Haskell & Barker Car Co.

THE CHICAGO, PEORIA & ST. LOUIS has ordered 200 box cars from the American Car & Foundry Company.

THE BOSTON ELEVATED has ordered 30 passenger cars from the Pressed Steel Car Company and 25 passenger cars from the American Car & Foundry Company.

THE WABASH has asked authority of the courts to purchase 200 hopper cars, 750 automobile cars, 20 passenger cars, 1,000 steel underframes for box cars, and 1,000 steel underframes for stock cars.

THE NORFOLK SOUTHERN has ordered 300 box cars and 6 caboose cars from the Mt. Vernon Car & Manufacturing Company and 160 flat cars from the American Car & Foundry Company.

SIGNALING.

The Canadian Pacific has installed automatic block signals—Hall, three-position, upper quadrant—on its line between St. John, N. B., and Vanceboro, Me., 90 miles.

Supply Trade News.

The Watson-Stillman Company, New York, has moved its Chicago office from the Rookery to the McCormick building.

The Pittsburgh, Forge & Iron Company, Pittsburgh, Pa., has moved its Chicago office from the McCormick building to the Railway Exchange.

E. O. Hopkins, of Chicago, general manager of the Indiana Tie Company, and formerly receiver of the Peoria, Decatur & Evansville, died in Chicago on April 3.

A. Otto Hiester, manager of the Buffalo office of the United States Light & Heating Company, and previously with the National Battery Company, has joined the sales force of the Edison Storage Battery Company, Orange, N. J.

A. E. Rosenthal has resigned his position as western representative of the Lima Locomotive Corporation, Lima, Ohio, and the Chicago office of that concern has been temporarily discontinued. Mr. Rosenthal retains his position as president of the National Railway Equipment Company, Chicago.

J. F. Duntley, father of W. O. Duntley, president of the Chicago Pneumatic Tool Company, and of J. W. Duntley, president of the Duntley Pneumatic Sweeper Company, died on April 5 at his residence in Detroit, Mich. He was at one time vice-president of the Chicago Pneumatic Tool Company, and was actively interested in the affairs of the company up to the time of his death. He was 71 years old.

TRADE PUBLICATIONS.

PNEUMATIC TOOLS.—The Chicago Pneumatic Tool Company has issued bulletins Nos. 137, 138 and 139, describing various types of the Chicago Giant rock drill and appurtenances.

COALING STATIONS.—The Roberts & Schaefer Company, Chicago, published a very attractive booklet illustrating and briefly describing its reinforced, concrete, Holmen, locomotive, coaling stations.

MOTOR CARS.—The Buda Company, Chicago, has issued catalog No. 184, illustrating and describing the specifications of its various types of motor cars for railroad inspection, section and maintenance service.

CRANES.—The Industrial Works, Bay City, Mich., has published bulletin No. 209, illustrating and describing its wrecking, locomotive, construction and freight cranes, also its transfer tables and pile drivers.

UNIONS.—The Jefferson Union Company, Lexington, Mass., has published a brief illustrated folder outlining the career of Simon Bolivar, who liberated South America from Spanish control, and concisely describing the success with which Jefferson Unions have met.

CULVERTS.—The California Corrugated Culvert Company, Los Angeles, Cal., has published a handsome catalog illustrating many installations of its corrugated culverts, and pointing out their advantages. A table showing the capacity of corrugated iron culverts is included.

CAR HEATING.—The Gold Car Heating & Lighting Company, New York, has published an illustrated book of instructions relating to the installation of steam heat and hot water circulation systems for passenger trains, for use by passenger trainmen, engineers, car inspectors, etc.

GAGES.—The Ashcroft Manufacturing Company, Boston, Mass., has published a 128-page illustrated booklet on its steam pressure and vacuum gages, Edson recording gages, Tabor engine indicators, engineering specialties and pipe tools. This booklet includes prices and a convenient index.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—The passenger department of this company has devoted two illustrated folders to interesting accounts of the events which took place along its lines during the Civil War. These folders are intended for those who expect to attend the United Confederate Veterans' Reunion, to be held at Chattanooga, Tenn., May 27-29.

Railway Construction.

CANADIAN NORTHERN.—The Alberta legislature has been asked to authorize the Canadian Northern Western to construct railway lines as follows: From Taber northeasterly to Consort; from Medicine Hat northwesterly to the Canadian Northern Saskatoon-Calgary line; from the Canadian Northern Saskatoon-Calgary line northerly to the Canadian Northern main line in range 6 or range 9, west 4th meridian; from the Canadian Northern Saskatoon-Calgary line northeasterly to the eastern boundary of the province; from Cardston westerly to the western boundary of the province, and from Metting Creek on the Canadian Northern Vegreville-Calgary line to Wetaskiwin, and thence westerly via Pigeon Lake to the Canadian Northern Strathcona-Pincher Creek line. These lines are in addition to those authorized in the company's charter, which include a line from Edmonton or Strathcona to the western boundary of the province, near the Pine or Peace River Pass, and from a point on the line between Edmonton and Calgary to Rocky Mountain House, thence to the Brazeau and Macleod rivers, and continuing to a junction with the Canadian Northern main line west of Edmonton. M. H. MacLeod, Winnipeg, Man., is general manager and chief engineer.

CANADIAN NORTHERN WESTERN.—See Canadian Northern.

CANADIAN PACIFIC.—On the eastern lines, 14.2 miles of main line, between St. John, N. B., and McAdam, are being relaid with 85-lb. rail, replacing 80-lb. sections, and on 126 miles of branch lines, 72-lb., 73-lb., and 80-lb. rails are being laid, replacing 48-lb., 56-lb., 60-lb. and 62-lb. rails.

According to press reports bids are wanted April 15 for the construction of a diversion of the main line from mile 69 Mountain division, which is one mile west of Six Mile Creek, B. C., to mile 92, two miles west of Cambie. The work includes piercing a long tunnel. The new line is to have easier grades and the summit will be 533 ft. lower than the existing line. In addition, the distance will be shortened three miles; the curvature reduced by 2,356 degrees, and $4\frac{1}{2}$ miles of snow sheds and 2,260 ft. of steel bridges will be eliminated.

CAPE GIARDEAU NORTHERN.—This road has been extended from Coffman, Mo., west to Farmington, 14 miles.

CHESAPEAKE & OHIO.—This company has let a contract for the construction of a 22-mile line down Beaver Creek into Lloyd and Pike counties, Kentucky, through a rich coal and timber section.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded contracts for the grading for second track between Elberon, Ia., and Tama, 16 miles, and also between Dunbar and Capron, to the Walsh Construction Company, Davenport, Iowa. This work involves the handling of about 625,000 yd. of earth. All grading for second track between Green Island, Ia., and Manilla is now under contract.

EDMONTON, STONY PLAIN & WABAMUN (Electric).—This company has been granted a charter in Canada to build from Edmonton, Alta., west to Stony Plain, thence to Lake Wabamun, about 45 miles. E. S. McQuaid, president, Edmonton. A. Boileau, Edmonton, is interested. (March 14, p. 529.)

FLORIDA ROADS.—We are informed that surveys are being made for a line from Charlotte Harbor, Fla., northwest via Murdock to Venice, about 15 miles. There will be one important trestle on the line. W. J. Bowling, St. Louis, Mo., is back of the project.

GLENGARRY & STORMONT.—The Canadian parliament has been asked to incorporate this company to build railway lines from the Canadian Pacific at St. Polycarp Junction, Que., southwesterly through Lancaster township, Ont., and Charlottenburg township, and Cornwall township to Cornwall. Pringle, Thompson and Burgess, Ottawa, are acting for the applicants.

GRANTS PASS-CRESCENT CITY.—Organized in Oregon with \$5,000,000 capital to build from Grants Pass on the Southern Pacific, in Josephine county, Ore., southwest to Crescent City in Del Norte county, Cal., about 100 miles. The incorporators include J. F. Reddy, Medford, W. W. Harmon and L. C. Gilkey, Grants Pass.

HUDSON RIVER CONNECTING.—See New York Central & Hudson River.

MIDLAND VALLEY.—Financial arrangements have been made, it is said, to build an extension from Wichita, Kan., northwest towards Denver, Colo.

NASHVILLE, SHILOH & CORINTH.—Plans are being made, it is said, to build a line to connect Nashville, Tenn., with Corinth, Miss. The route from Nashville will be through the counties of Davidson, Williamson, Hickman, Lewis, Perry, Wayne and Hardin in Tennessee and Alcorn county in Mississippi, about 150 miles. J. H. Carpenter, J. W. Ross, J. B. Walker and G. A. Hazzard are interested.

NATIONAL RAILWAYS OF MEXICO.—The Durango-Muleros line of the Durango division has been extended from Muleros, Mex., southeast to Mena, 26 miles.

NEW YORK CENTRAL & HUDSON RIVER.—Under the name of the Hudson River Connecting a line is to be built from a point on the New York Central & Hudson River at Stuyvesant, N. Y., thence over a bridge crossing the Hudson river to a connection with the West Shore at Feura Bush. A two-mile branch is to be built from Feura Bush south to another connection with the West Shore, and a second branch is to be built from Stuyvesant to a connection with the Boston & Albany. There will be one bridge in addition to the one to be built over the Hudson river. Stuyvesant is 18 miles south of Albany, and the proposed connection will form an outside route for the heavy movement of freight which now goes through Albany.

PACIFIC GREAT EASTERN.—This company, which is building from Vancouver, B. C., north to the Grand Trunk Pacific at Fort George, about 350 miles, has plans under consideration, it is said, for eventually extending the line from Fort George through undeveloped portions of northern British Columbia and the Yukon, also through Alaska. (December 20, p. 1235.)

SAN ANTONIO, UVALDE & GULF.—This company has opened for business the Pleasanton-Campbellton subdivision from Pleasanton, Tex., south to Campbellton, 20.6 miles.

SOUTH CAROLINA WESTERN.—An officer writes that work is about finished on a branch from Lydia, S. C., southeast to Timmons ville, about 15 miles. No plans have been made or are contemplated for an extension from Timmons ville south to Olanta.

TWIN MOUNTAIN & POTOMAC.—This road has been extended from Burlington, W. Va., to Twin Mountain. (September 6, p. 454.)

RAILWAY STRUCTURES.

CHICAGO, ILL.—The Baltimore & Ohio has given a contract to James Stewart & Co., New York and Chicago, for the construction of a large grain elevator in the Calumet river district, South Chicago, to have a capacity of 875,000 bushels.

MARQUETTE, MICH.—The Duluth, South Shore & Atlantic has announced that it will build a 15-stall roundhouse and a 75 ft. turntable.

O'BRIEN, QUE.—Bids are wanted by P. E. Ryan, secretary of the Commissioners of the Transcontinental Railway at Ottawa, Ont., on April 30, for building a 12-stall engine house without machine shop at O'Brien. W. J. Press, mechanical engineer, Ottawa, Ont.

SPOKANE, WASH.—The Spokane, Portland & Seattle has announced plans for the expenditure of \$200,000 for roundhouses, car shops and storage tracks.

SWEETWATER, TEX.—It is reported that the Kansas City, Mexico & Orient will build a new passenger station.

WINNIPEG, MAN.—Contracts have been let for bridge construction on the Grand Trunk Pacific from mile 1,094 to mile 1,486 west of Winnipeg at a cost of \$2,000,000, as follows: McLellan Creek crossing, 249 ft.; Little Shuswap crossing, 129 ft.; Rau Shuswap crossing, 1,032 ft.; Cottonwood Creek crossing, 129 ft.; Fifty Mile river crossing, 129 ft.; Goat river crossing, 308 ft.; Dome Creek crossing, 129 ft.; Second Fraser river crossing, 689 ft.; Third Fraser river crossing, 968 ft.; Willow river crossing, 459 ft.; Fourth Fraser river crossing, 1,227 ft.; Upper Nechaco river crossing, 642 ft.; Bulkley river crossing, mile 1,481, 254 ft., and Bulkley river crossing, mile 1,486, 364 ft.

Railway Financial News

ALGOMA CENTRAL TERMINALS, LTD.—This company offered in London \$2,636,500 first mortgage 5 per cent. 50 year bonds. This makes \$5,136,500 bonds of this issue outstanding. The proceeds will be used for the completion of terminal facilities at Sault Ste. Marie and other points.

BOSTON & MAINE.—This company has applied to the Massachusetts railroad commission for authority to consolidate with the Hampden Railroad under an agreement entered into between the two companies on March 14.

BROOKLYN RAPID TRANSIT.—Application has been made to the New York Public Service Commission, First district, for authority to purchase, through its subsidiary, the Coney Island & Gravesend \$2,583,100 of the outstanding \$2,983,900 stock of the Coney Island & Brooklyn, and also to acquire the remainder of the stock in future. The Coney Island & Gravesend also applied for permission to make a mortgage to secure \$3,000,000 bonds to purchase this stock.

CAMBRIA & CLEARFIELD.—See Pennsylvania Railroad.

CHICAGO, MILWAUKEE & ST. PAUL.—Holders of the \$2,155,000 Milwaukee & Northern first mortgage extended $4\frac{1}{2}$ per cent. bonds, due June 1, 1913, and the \$4,003,000 Milwaukee & Northern consolidated mortgage 6 per cent. bonds, due June 1, 1913, are notified that the mortgages securing these bonds will be extended to June 1, 1934, at $4\frac{1}{2}$ per cent. The liens of the mortgages will continue unimpaired, the payment of principal and interest having been assumed by the Chicago, Milwaukee & St. Paul.

This company has sold \$30,000,000 general mortgage $4\frac{1}{2}$ per cent bonds to Kuhn, Loeb & Company, and the National City Bank, both of New York. Previous issues under St. Paul's general mortgage have borne interest at the rate of $3\frac{1}{2}$ per cent. and 4 per cent. The bonds are due 1989.

CONEY ISLAND & BROOKLYN.—See Brooklyn Rapid Transit.

CONEY ISLAND & GRAVESSEND.—See Brooklyn Rapid Transit.

DENVER NORTHWESTERN & PACIFIC.—The foreclosure sale of this company has been set for April 18.

LARAMIE, HAHN'S PEAK & PACIFIC.—The junior security holders' committee of Boston has provided a plan for the reorganization of this company without foreclosure. This plan provides for the organization of a new company in Wyoming with \$2,000,000, 6 per cent. non-cumulative preferred stock and \$3,000,000 common stock. Holders of the present \$1,000,000 unsecured notes and \$430,000 unsecured claims are called upon for a 10 per cent. assessment and will get 110 per cent. in new preferred stock. The preferred and common stockholders are assessed 4 per cent.; the preferred holders getting 54 per cent. in new preferred stock and 50 per cent. in new common stock; and the common stockholders, 4 per cent. in preferred and 20 per cent. in common. Bonds of the old company comprising \$240,000 first mortgage 6 per cent. bonds, \$1,536,000 first refunding 6 per cent. bonds, \$450,000 collateral trust 7 per cent. notes and \$500,000 general mortgage 5 per cent. bonds will be left undisturbed. The assessments total \$507,000, which is sufficient to take care of the interest charges up to April, 1915, the end of the period which the committee regards as sufficient to demonstrate the working of its plan. It is understood that this plan is acceptable to the senior security holders' committee.

LONG ISLAND RAILROAD.—The New York Public Service Commission, Second district, has approved of the merger by this company of the Oyster Bay Extension Railroad. The latter runs from Locust Valley to Oyster Bay, about 5 miles, and is operated by the Long Island.

LOUISVILLE & NASHVILLE.—Kissel, Kinnicutt & Company and Harris, Forbes & Company, both of New York, will shortly offer the unsold portion of a block of \$4,500,000 Atlanta, Knoxville & Cincinnati division 4 per cent. bonds, dated April, 1905-May, 1955.

MOBILE & OHIO.—Holders of the general mortgage bonds will vote on April 23, on the question of authorizing the purchase of the St. Louis & Cairo, now leased, and the making of a

mortgage thereon to secure \$3,000,000 Mobile & Ohio-St. Louis division 5 per cent. bonds, dated August 1, 1913-December 1, 1927.

NEW YORK, NEW HAVEN & HARTFORD.—See New York, Westchester & Boston.

NEW YORK, WESTCHESTER & BOSTON.—The New York Public Service Commission, Second district, has authorized this company to issue \$6,044,000 first mortgage bonds. Of this issue \$1,290,000 bonds are to be sold at not less than par, and the balance at not less than 92. The proceeds of this sale will be used for right of way, stations and construction purposes; also for paying off outstanding notes held by the New York, New Haven & Hartford.

T. DeWitt Cuyler and George F. Baker have been elected directors of this company, succeeding Lewis Cass Ledyard and G. M. Miller, resigned.

OYSTER BAY EXTENSION RAILROAD.—See Long Island Railroad.

PENNSYLVANIA RAILROAD.—The \$165,000 Bells Gap Railroad 6 per cent. bonds due April 1 were paid on and after maturity. The Philadelphia Stock Exchange, on March 25, struck from the regular list \$745,000 Cambria & Clearfield first mortgage 5 per cent. bonds due 1941, which have been canceled and destroyed.

The directors of this company have authorized an issue of approximately \$45,400,000 common stock. The proceeds will be used to take up \$10,222,500 of $3\frac{1}{2}$ per cent. convertible bonds which matured November 1, 1912, and \$9,735,000 of collateral trust $4\frac{1}{2}$ per cent. bonds due June 1, 1913. The remainder of about \$25,000,000 will be used for equipment and ordinary improvements.

PERE MARQUETTE.—The collateral securing the \$8,000,000 five year, 6 per cent. collateral notes, dated March 1, 1911, was bid in by the committee representing \$7,944,000 of these notes. The cash distribution which is being made out of the proceeds of this sale applies only to the remaining \$56,000 notes, their share being \$799.40 on each \$1,000 of face value.

ST. LOUIS & CAIRO.—See Mobile & Ohio.

SOUTHERN PACIFIC.—See Union Pacific.

UNION PACIFIC.—Attorney General McReynolds, on April 9, disapproved the new plan for the dissolution of the Union Pacific-Southern Pacific merger recently submitted to him by Robert S. Lovett, chairman of the Union Pacific board. The Union Pacific, nevertheless, will submit the plan to the United States court at St. Louis. The plan proposes that the Union Pacific place its \$126,000,000 Southern Pacific stock in the hands of a trustee for a limited time, receiving beneficiary certificates for it. The stock would be disfranchised. Stockholders of the Union Pacific would be permitted to buy a thousand shares each.

WABASH.—The receivers have filed in the federal courts application for permission to expend \$7,489,500 for improvements, including \$3,525,000 for motive power and rolling stock, \$1,101,000 for new 100 lb. rails, and \$2,954,500 for track elevation and double tracking.

YOUNGSTOWN & OHIO.—This company, on March 31, paid a quarterly dividend of three-quarters of 1 per cent. on the \$1,000,000 5 per cent. preferred stock as compared with $1\frac{1}{2}$ per cent. quarterly in 1912, making $4\frac{1}{2}$ per cent. during that year.

RATES ON OIL IN RUSSIA.—In 1910 the rates for carrying petroleum from the oil fields on the Caspian Sea around Baku to the Black Sea port Batum were reduced nearly one-third, from 27 cents to $18\frac{1}{2}$ cents per 100 lbs., avowedly for the purpose of enabling the Russian oil to compete with the Standard Oil Company in the markets of western Europe. Now the Russian ministry of transportation affirms that it has not had this effect; that Russian exports have diminished, while the carriers have suffered serious losses from the reduced rates. Moreover, the ministry is of the opinion that an increase in exports is not desirable, as it tends to increase the cost to Russian consumers; and it favors the restoration of the old export rates. It is reported that the Austrian government takes a similar view of the petroleum production of Galicia, which has become very important of late years, and that it purposes to raise the export rates.